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BULLETIN, IOWA STATE COLLEGE
VOL. I, NO. 4 JUNE, 1903

IOWA STATE COLLEGE

AGRICULTURE AND THE
MECHANIC ARTS

DIVISION

OF

AGRICULTURE

AMES, IOWA

1903-1904

PUBLISHED BY THE COLLEGE, AT LEAST FOUR NUMBERS DURING EVERY CALENDAR YEAR. ENTERED AT THE POST OFFICE, AMES, IOWA, AS SECOND CLASS MATTER

BULLETIN, IOWA STATE COLLEGE
VOL. I, NO. 4 JUNE, 1903

CATALOGUE

OF THE

Division of Agriculture

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AGRONOMY
DAIRYING
ANIMAL HUSBANDRY
HORTICULTURE
AGRICULTURAL CHEMISTRY

SCIENCE WITH PRACTICE.

AMES, IOWA

1903-1904

CALENDAR-1903

JANUARY.

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1903/04

CALENDAR FOR 1903-1904

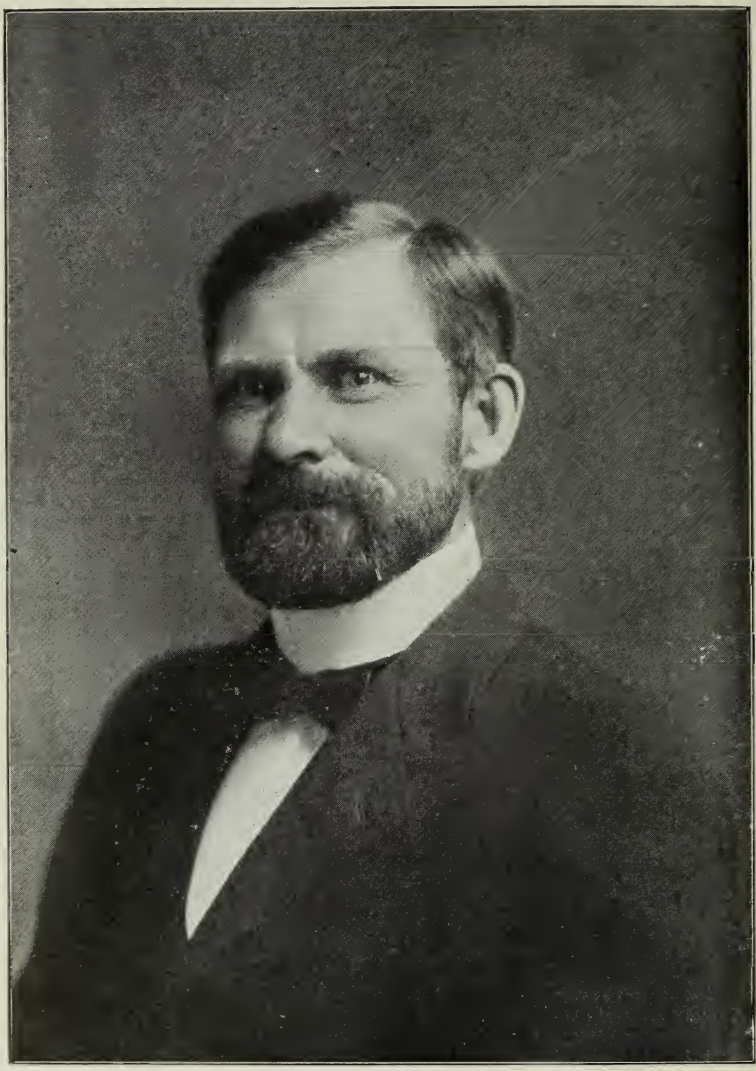
1903

First Term of College Year begins.....Tues., Sept 1.
Entrance Examinations.....Tues.-Wed., Sept. 1-2
Recitations begin.....Thurs. Sept. 3
Thanksgiving Day.....Thurs., Nov. 26
Term Examinations.....Dec. 21-22
Winter Vacation.....Dec. 22, 1903, to Jan. 19, 1904

1904.

Special Courses in Animal Husbandry and Agronomy.....Jan. 4-16
Second Term of College Year begins.....Tues., Jan. 19
Entrance Examinations.....Tues.-Wed., Jan. 19-20
Recitations begin.....Thurs., Jan. 21
Memorial Day.....Mon., May 30
Baccalaureate Address.....Sun., June 5
Term Examinations.....June 6-7
Commencement.....Wed., June 8

" * * * In a very true sense, the great spirits who have departed this life are still with us in the strife of our earthly days."—MABIE.



The Late President W. M. Beardshear.

"Forenoon and afternoon and night, Forenoon,
And afternoon, and night,
Forenoon and — what!
The empty song repeats itself. No more?
Yea, that is Life; make this forenoon sublime,
This afternoon a psalm, this night a prayer,
And Time is conquered, and thy crown is won."
—SILL.

William Miller Beardshear was born at Dayton, Ohio, November 7, 1850; spent his boyhood on the farm; entered the army of the Cumberland at fourteen years of age; was educated in the public schools of Ohio; took B. A. and M. A. degrees, Otterbein University, Ohio; took two years post graduate work at Yale University; had the degree of LL. D.; was president of Western College, Toledo, Iowa, '81-'89, at that time was one of the youngest college presidents in the United States; Superintendent of City Schools, Des Moines, Iowa, '89-'91; President or the Iowa State Teachers' Association, 1894; served a term on the executive committee of the Iowa State Teachers' Association; was director of the N. E. A. from Iowa for a number of years; was President, one year, of the Department of Manual Industry and Training, National Educational Association; President of the Iowa State Improved Stock Breeders' Association, 1899; member of the United States Indian Commission, 1897-1902; was juror on Educational Awards at the Pan-American Exposition, Buffalo, 1901; President National Educational Association, 1901-'02; President Iowa State College, Ames, 1891-1902. Died August 5, 1902—Ames, Iowa.

FACULTY TRIBUTE

The faculty of the Iowa State College, moved by feelings of profound sorrow and deepest sympathy in the great loss of our lamented President, hereby unite in expression of the following appreciation.

The loss of an eminent leader in any rank of life is a misfortune of far reaching consequence, but the loss of a great leader of educational and moral forces is especially to be deplored. It rarely falls to the lot of any man to possess in such large measure the general esteem and confidence, and to impress so deeply for good, the lives of so many people of all classes, as was reached and influenced by Dr. Beardshear. No one could know him but to be the better for his acquaintance. His genial personality, gentleness and strength, were ever a source of renewed energy and higher endeavor. His labors as President of the Iowa State College were the crowning work of a fruitful life. Coming to the institution at a critical period, he rendered an eminent service which was the product of a master mind and genius. His personal achievements were of the highest order, but in addition he possessed that rare and essential quality of every great leader, — the faculty of developing and stimulating the best that is in every one else.

The leadership of President Beardshear was in every way typical of a great life, such a life as Lowell characterized in the following lines:

> All thoughts that mould the age begin
> Deep down within the primitive soul,
> And from the many slowly upward win,
> To one who grasps the whole.

The deep, silent forces and the earnest, exalted purposes that were the source of power in President Beardshear's life, were manifest in all his work. His plans, born of a large heart, a keen perception and intuitive mind, were always broad and progressive and typical of his inspiring faith, and his generous and magnanimous nature. His work was peculiarly original; striking in conception, and masterful in execution. Though entering a new field on assuming the duties of

executive of an Agricultural and Mechanical College, the broad sympathies with humanity, and his active interest in the industrial professions, enabled him at once to grasp the needs and understand the functions and purposes of the land-grant colleges so comprehensively and intelligently that he became the acknowledged leader in the ranks of all similar institutions of America, and he was unanimously accorded the distinguished honor of the presidency of the National Educational Association, an honor never before conferred upon a citizen of Iowa, or an officer of a land-grant college. It was his work more than that of any other man of his time that served to place industrial and practical education in its true light, and to command the respect and admiration of the educational forces of the world.

His prophetic vision, his keen perception and accurate analysis, and above all, his sublime faith, were inspiring to all who came under the influence of his magic power, and his qualities of leadership were inherent and without effort.

President Beardshear was an ideal leader and director of the efforts and work of his assistants, the faculty and instructors of this college. As a leader he foresaw the needs, secured the material means, and selected those who could best assist him in carrying out his plans. As a director of our efforts and work, he had the happy way of placing and inspiring confidence so that effort was united, and work was done without friction and with results fruitful along the lines he had laid down for the guidance of the institution to the permanent success which he desired.

To his associates he manifested the purest friendship and the noblest manhood; and more than leader and director, President Beardshear was a friend to each and all of us and his friendship was the reward most sought by his co-workers of the faculty, and furnished sufficient inspiratien for untiring energy on our part during his life, and now strengthens and inspires us to carry on the task so well begun under his wise, energetic and friendly direction.

"One of the wisest things this government ever did was to make ample provision for the great agricultural institutions in this land. We now have more than half a hundred of them to testify to the worth and sagacity of the Congress of these United States."—President McKinley, at Ames, Iowa, in October, 1898.

BOARD OF TRUSTEES

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W. J. DIXON, Ames.....*Acting Secretary*
HERMAN KNAPP, Ames.....*Treasurer*
W. A. HELSELL, Odebolt.....*Financial Secretary*
JOHN FRANKLIN CAVELL, Ames.....*Custodian*

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Ex-officio—HON. ALBERT B. CUMMINS, Governor of Iowa.
Ex-officio—HON. R. C. BARRETT, Superintendent of Public Instruction.

Term Expires.

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Second District—HON. C. S. BARCLAY, West Liberty.....1904
Third District—HON. E. A. ALEXANDER, Clarion.....1908
Fourth District—HON. C. L. GABRILSEN, New Hampton.....1904
Fifth District—HON. W. R. MONINGER, Galvin.....1906
Sixth District—HON. W. O. MCELROY, Newton.....1908
Seventh District—HON. W. K. BOARDMAN, Nevada.....1906
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Eleventh District—HON. W. J. DIXON, Sac City.....1906

STANDING COMMITTEES.

GROUP I.

Finance Committee: Gov. Cummins, Trustees McElroy, Barclay, Penick, Alexander, Hungerford.
Building Committee: Trustees Dixon, Hungerford, Boardman; additional members, Watkins, Gabrilsen.

GROUP II.

Committee on Agriculture, Horticulture, Experiment Station and Veterinary Science: Trustees Barclay, Boardman, Moninger, Wilson, Gov. Cummins.
Committee on Engineering Departments and Physics: Trustees Gabrilsen, Barrett, McElroy, Hungerford, Dixon.

Committee on College Hospital and Sanitary Arrangements: Trustees Watkins, Moninger, Penick.

GROUP III.

Committee on Faculty and Courses of Study: Trustees McElroy, Barrett, Hungerford, Gabrilsen, Alexander, Dixon.

Committee on College Lands and Investments: Trustees Penick, Moninger, Gov. Cummins.

Committee on Rules: Trustees Wilson, Boardman, Alexander.

GROUP IV.

Committee on Scientific Departments: Trustees Alexander, Gabrilsen, Barrett, McElroy, Watkins.

Committee on Literary Departments and Library: Trustees Wilson, Boardman, Barrett, Alexander, Penick.

Committee on Public Grounds and Assignment of Rooms: Trustees Hungerford, Alexander, Barclay.

Committee on Bonds: Trustees Moninger, Wilson.

MEETINGS.

The annual meeting of the Board of Trustees is held in June. Other meetings are held as may be necessary.

View of the College Grounds from the East.

"I am not learned in agriculture though I was born and reared upon a farm, and whatever education I acquired was paid for by the proceeds of corn and wheat and hogs."—Ex-President Harrison.

OFFICERS OF INSTRUCTION

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Acting President.

JAMES WILSON, M. S. A.,
Lecturer.

CHARLES F. CURTISS, B. Sc., M. S. A.,
Director of Experiment Station and Dean of Agriculture.

**J. L. BUDD, M. H.,
Professor Emeritus in Horticulture.

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Chemist of the Experiment Station.

W. J. KENNEDY, B. S. A.,
Professor of Animal Husbandry and Vice Director of Experiment Station.

GEORGE LEWIS McKAY,
Professor of Dairying.

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Professor of Horticulture and Forestry.

W. H. STEVENSON, A. B.,
Soils.

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Assistant Professor of Horticulture.

W. J. RUTHERFORD, B. S. A.,
Assistant Professor of Animal Husbandry.

W. H. OLIN, M. Sc.,
Assistant in Farm Crops.

C. LARSON, B. S. A.,
Instructor in Dairying.

E. C. MYERS, B. S. A.,
Instructor in Agricultural Chemistry.

WAYNE DINSMORE,
Instructor in Animal Husbandry.

EDWARD E. LITTLE, M. S. A.,
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ALFRED ATKINSON,
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GEN. JAMES RUSH LINCOLN,
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Dean of Veterinary Science and Professor of Anatomy and Surgery.

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Professor of Veterinary Medicine and Sanitary Science.

TALBOT LENNOX,
Instructor in Dairy Machinery.

EZRA C. POTTER,
Instructor in Wood Work.

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Instructor in Latin and English.

ERNEST ALANSON PATTENGILL, B. S.,
Instructor in Mathematics.

E. B. TUTTLE, B. Sc. IN E. E.,
Instructor in Physics.

MISS HELEN G. REED, PH. B.,
Instructor in English.

MISS ELIZABETH MACLEAN, M. DI.,
Instructor in English.

MISS GRACE NORTON,
Instructor in German.

JOSEPH E. GUTHRIE, M. S.,
Instructor in Zoology.

MISS JULIA COLPITTS, M. A.,
Instructor in Mathematics.

MISS VINA ELETHE CLARK,
Librarian.

MISS OLIVE E. STEVENS, B. L.,
Assistant Librarian.

"The farmer's trade is one of worth,
He is partner with the sky and earth,
He's partner with the sun and rain,
And no man loses for his gain,
And men may rise and men may fall,
The farmer he must feed them all."

HISTORICAL

LOCATION

BUILDINGS, GROUNDS AND EQUIPMENTS

HISTORICAL

In 1858 the Legislature of Iowa passed an act to establish "A State Agricultural College and Model Farm," to be connected with the entire agricultural interests of the State; appointed a board of commissioners to buy a farm and erect a college building, and elected a board of trustees to select a faculty and organize a college. In 1859 a farm of six hundred and forty acres, situated near Ames, was purchased for the use of the college. The farm now contains eight hundred and forty acres.

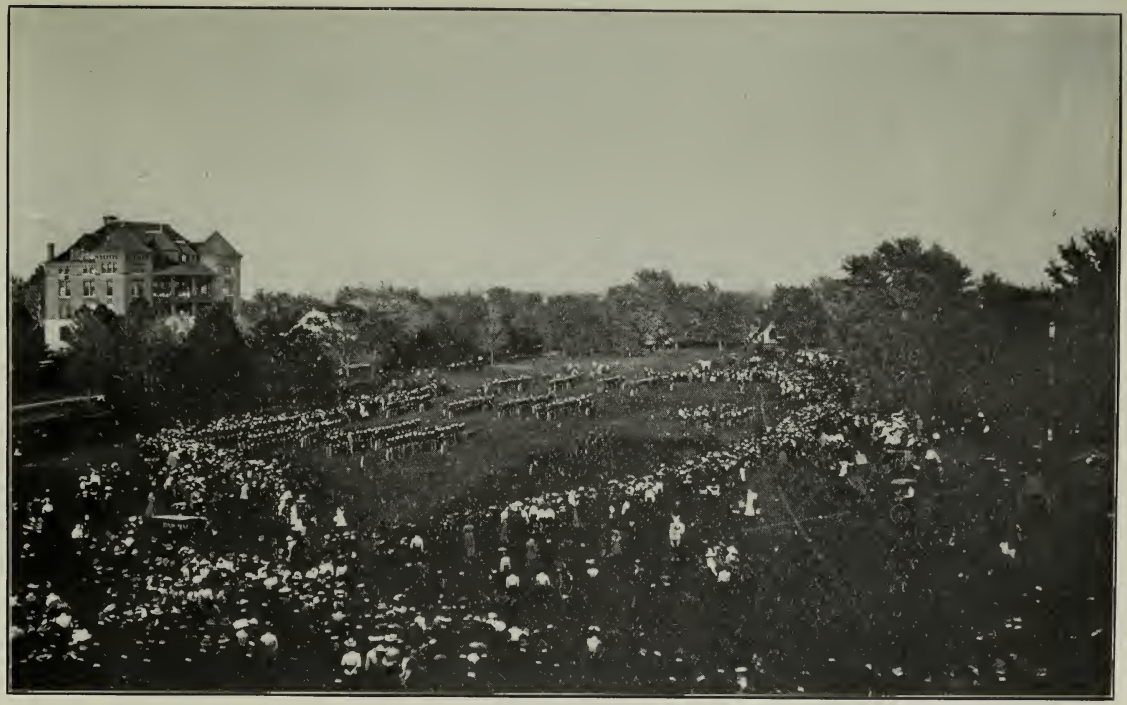
In 1862 a bill was passed by Congress, entitled, "An act donating public lands to the several States and Territories, which may provide colleges for the benefit of Agriculture and the Mechanic Arts."

Section 1 of this act provides that for the support of such colleges there be granted "an amount of public land, to be apportioned to each State in quantity to equal thirty thousand acres for each Senator and Representative in Congress to which the States are respectively entitled by the apportionment under the census of 1860; provided that no mineral lands shall be selected or purchased under the provisions of this act."

Section 4 requires: "That all moneys derived from the sale of lands aforesaid by the States to which lands are apportioned, and from the sale of land script, hereinbefore provided for, shall constitute a perpetual fund, the capital of which shall remain forever undiminished (except as may be provided for in section fifth of this act), and the interest of which shall inviolably be apportioned by each State which may take and claim the benefit of this act, to the endowment, support and maintenance of at least one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the Legislature of the State may provide, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Section 5 says: "And be it further enacted, that the grant of land and land script hereby authorized, shall be made on the following conditions, to which, as well as the provisions herein-

"The dignity of the sciences is that they think out God's thoughts after him; the nobility of the handicraft is that they repeat God's works.—Rev. N. D. Hillis.



Excursion Day

"While I am a son of Harvard, I believe that the state land grant institutions are doing a greater work and are closer to the hearts of the people than many of the older and better equipped colleges.—President Theodore Roosevelt, Nov., '01.

before contained, the previous assent of the several States shall be signified by legislative acts; first, if any portion of the fund, invested as provided by the foregoing section, or any portion of the interest thereon, shall, by any action or contingency, be diminished or lost, it shall be replaced by the State to which it belongs, so that the capital of the fund shall remain forever undiminished; and the annual interest shall be regularly applied without diminution to the purposes mentioned in the fourth section of this act, except that a sum not exceeding ten per centum upon the amount received by any State under the provisions of this act, may be expended for the purchase of land for sites or experimental farms, wherever authorized by the respective Legislatures of said States. Second, no portion of said fund nor the interest thereon shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation or repair of any building or buildings."

The General Assembly of Iowa, September 11, 1862, accepted the grant upon the conditions and under the restrictions contained in the act of Congress, and by so doing entered into contract with the General Government to erect and keep in repair all buildings necessary for the use of the College. By this action of the General Assembly the College was changed from an agricultural institution into a College of Agriculture and Mechanic Arts, with the broad and liberal course of study outlined in the following paragraph.

In 1882 the General Assembly passed an act defining the course of study to be pursued as follows: Section 1. That section 1621 of the Code is hereby repealed and the following is enacted in lieu thereof: "Section 1621. There shall be adopted and taught in the State Agricultural College, a broad, liberal and practical course of study, in which the leading branches of learning shall relate to agriculture and the mechanic arts, and which shall also embrace such other branches of learning as will most practically and liberally educate the agricultural and industrial classes in the several pursuits and professions of life, including military tactics. Section 2. That all acts, and parts of acts inconsistent with this act are hereby repealed."

August 30th the following act was approved by President Harrison: "Be it enacted by the Senate and House of Representatives of the United States in Congress assembled, that there shall be and hereby is, annually appropriated, out of any moneys in the treasury not otherwise appropriated, arising from the sales

of public lands, to be paid as hereinafter provided, to each State and Territory for the more complete endowment and maintenance of colleges for the benefit of agriculture and the mechanic arts now established, or which may hereafter be established, in accordance with an act of Congress approved July second, eighteen hundred and sixty-two, the sum of fifteen thousand dollars for the year ending June thirtieth, eighteen hundred and ninety, and an annual increase of the amount of such appropriation thereafter for ten years by an additional sum of one thousand dollars over the preceding year, and the annual amount to be paid thereafter to each State and Territory shall be twenty-five thousand dollars, to be applied only to instruction in agriculture, the mechanic arts, the English language and the various branches of mathematical, physical, natural and economic science, with special reference to their application in the industries of life, and to facilities for such instruction."

The income of the College from National grants is therefore expended in instruction, experimentation and illustration in agriculture and in the mechanic arts, and in underlying and related science and literature.

All buildings are erected and all repairs thereon are made by the State of Iowa, the cost down to date being about $600,000.

The College was formally opened on the 17th of March, 1869.

"Every pine and fir and hemlock
Wore ermine too dear for an earl,
And the poorest twig on the elm tree
Was ridged inch-deep with pearl."

—LOWELL.

"There is no aristocracy except the aristocracy of industry."—SECRETARY L. M. SHAW.

With light and heat refulgent."

—THOMSON

Agricultural Hall in Summer.

"I am for the man with his coat off, with his head and his hand skilled for some useful labor, and any where the peer of man trained in the professions."—BEARDSHEAR.

AMES AND THE COLLEGE

The College occupies a delightful and healthful location upon high rolling land, just west of Ames, Story County. The railroad facilities for reaching Ames from every part of the State are excellent. It is at the junction of the Des Moines and the northwestern branches and the main line of the Chicago & Northwestern R. R. The main line of the Chicago, Milwaukee & St. Paul intersects the Northwestern at Slater, eleven miles south, and the through line of the same system at Algona on the north. The main line of the Illinois Central intersects the Chicago & Northwestern at Webster City, just north, and the main line of the Iowa Central makes good connections at Marshalltown on the east. All the railway connections of Des Moines have thirty-seven miles to Ames. The Chicago & Northwestern Railway has frequent trains, Des Moines to Ames and return. A steam motor railway connects Ames and the College with efficient service. Ames is a most desirable town for wholesome college influences. Its people are enterprising, thrifty and cordial. The town has an excellent system of public schools, numerous churches, water works, electric lights, and a good city government. It affords wholesome surroundings for the students. It is an inviting community for families who wish to educate their children, enjoy the better elements of society and an environment of reasonable expenses. The town and the College are on very cordial terms, and its citizens take marked pains in the efforts of the students and the highest interests of the College. It is a model location for factories and business enterprises.

BUILDINGS, GROUNDS AND EQUIPMENTS

BUILDINGS.

Eighteen commodious buildings have been erected by the State, for the exclusive use of the various departments of the College, besides the dwelling houses and buildings for farm stock, machinery and work.

All these buildings are heated by steam and lighted by electricity. Pure water is supplied to all of the buildings.

There are two rooming cottages, brick buildings, affording rooms for ninety-four students.

The other buildings are as follows, used for recitation and lecture rooms and laboratories:

Chemical Hall: Brick, three stories throughout; steam heat; water and gas. Laboratory outfit complete for 100 students in Chemistry.

Veterinary Hospital: Brick, three stories, containing offices, dissecting rooms, and all modern appliances for the treatment of diseased animals.

Sanitary Hall: Frame, two stories; lower floor, office, kitchen and dining room for the hospital patients and rooms for convalescents; upper floor, seven rooms for care of sick among the students.

Engineering Laboratory: Brick, four stories, including basement, and large "L," containing machine shops, and the engineering laboratory, for the departments of Mechanical and Civil Engineering.

The Wood Shop: Brick, containing carpenter and pattern shops, with power and hand tools complete for wood work, and outfit of tools for individual work.

Forge Shop and Foundry: Brick, containing complete equipment for forging and moulding.

Engineering Hall: The Engineering Departments occupy the new Engineering Hall. This is a fire-proof building in which all the engineering departments have offices, recitation and lecture rooms, laboratories and engineering museum. This build-

ing is of Bedford stone, has plate glass windows, and modern conveniences and furnishings throughout. It is the best engineering building at present west of the Mississippi river.

Power House: Brick, one story, contains engine and boiler, furnishing power for the shops, and accommodates experimental work of the course in Mechanical Engineering. The dynamos and motor power for electric engineering are now in this building, also the deep well pump.

Locomotive Laboratory: This building contains an eight-wheel locomotive and tender presented by the Chicago & Northwestern Railway Company.

Music Hall: Brick, two stories, fitted up with apparatus and instruments for practice and instruction.

The Administrative Building: Brick, for the use of trustees and faculty, and for offices of the president, secretary and treasurer.

Dwelling Houses: Eighteen comfortable dwelling houses on the grounds are occupied by professor's families, and several others by foremen and employes.

Morrill Hall is named in honor of Hon. Justin S. Morrill, the originator of the "Land Grant" for Colleges of Agriculture and Mechanic Arts. The building cost about $35,000, including water supply, steam heat and electric light. It is of deep red brick, with stone foundation, and stone, brick and terra cotta trimmings interblended.

It stands on the high ground of the beautiful campus, north of and near the main building. It is for Chapel, capacity, 650; Library, containing 15,000 volumes; the Museum, Lecture Rooms and Laboratories of the Departments of Zoology and Geology.

Agricultural Hall is a four-story building. The lower stories are composed of stone from the State quarries at Anamosa, and the upper stories are brick. It contains rooms for Horticulture, Agriculture, Agricultural Chemistry, Experiment Station work and Veterinary Medicine. It is finely lighted and heated and contains modern improvements.

Green House: Contains propagating room, palm house and modern green house facilities.

The Horticultural Laboratory is a building 35x50 feet, two stories with basement. It is connected wih the green house. The main room contains desk room and lockers for 25 students. Adjoining is a pomology room with bench room for 25 students to work in the study of fruits. The building is provided with two

refrigerators, one for experimental work in cold storage and the other for storing fruits for class purposes. The second floor is provided with horticultural museum and facilities for photography.

Horse Barn and Stock Pavilion: A new barn composed of brick, slate roof, has just been completed for horses, the storage of grain and general farm purposes. One of the best stock pavilions in the country accommodating several hundred students at a time, circular in form, well heated and lighted, is located near this barn and gives first class advantages for stock judging and animal husbandry.

Other Buildings: Creamery, stables, barns, sheep and swine houses, seed houses, etc., sufficient for the requirements of the farm, are conveniently grouped near the College Campus.

MARGARET HALL.

A commodious and inviting building has been opened for the young women in the College. It is well designed for its purpose, built of brick, roofed with slate and is architecturally pleasing. It ocupies one of the most sightly locations on the campus, giving the most pleasing outlook to its occupants. It is provided with steam heat, electric lights, ample parlors, bath rooms and the most improved modern conveniences. It is neatly and tastefully furnished throughout. The Department of Domestic Economy also is located in the building and open to all young women of the College. Rooms will be assigned to new students in the order of their application. The young women are under the direction of an efficient dean of women.

THE COLLEGE GROUNDS.

The College domain includes about 840 acres. Of this about 125 acres are set apart for college grounds. These occupy the high land of the southwest part of the farm, and include the campus, shrubbery, plantations, young forestry plantations, the flower borders and gardens, with the beginnings of a botanical garden, and the surroundings of the professors' dwellings. Gravel drives, cement and gravel walks, lead to all parts of the grounds and to the various buildings, and the true principles of landscape gardening have been so faithfully observed in the gardening and in the location of buildings and drives as to make of the entire Campus a large and beautiful park. The view of the surrounding country from the upper stories of the large buildings is one of wide extent and great beauty.

A Typical Scene on the College Farm.

DIRECTIONS TO CANDIDATES AND STUDENTS

REQUIREMENTS FOR ADMISSION.

CLASSIFICATION AND GRADING.

UNDERGRADUATE COURSES OF STUDY AND DEGREES.

GRADUATE COURSES OF STUDY AND ADVANCED DEGREES.

ENTRANCE REQUIREMENTS

ADMISSION TO ACADEMIC YEAR.

YEAR BEGINS SEPTEMBER 1, 1903.

Candidates for admission to the first term of the Academic Year will be required to present satisfactory evidence of proficiency in geography, arithmetic, United States history, human physiology, algebra to simple equations, orthography, reading and grammar. They will also be required to present further satisfactory evidence of efficient preparation such as will enable them successfully to enter the Freshman Year on completion of the year of Academic work. When an examination in grammar is required it will cover the following subjects: The eight parts of speech, the classification of nouns, pronouns, adjectives, and adverbs, the declension of nouns and pronouns, the comparison of adjectives and adverbs, and the rules of spelling that apply in grammatical inflection. For further information see sample examination questions in Preparatory Grammar, page 33. Examinations will be held on the first and second days of the school year.

ADMISSION TO SECOND TERM OF ACADEMIC YEAR.

TERM BEGINS JANUARY 19, 1904.

Students seeking admission to the second term of the Academic Year will need to meet the requirements for admission to the first term and in addition thereto, pass a satisfactory examination in the studies of that term. In lieu of examinations in history and drawing, standings of approved high schools will be accepted. No student assigned to the algebra of the first term will be allowed to take plane geometry. Graduates of schools included in either list of "Accredited Schools" will be accepted on trial without examination.

The examination in algebra will include addition, subtraction, multiplication, division, factoring, highest common factor, lowest common multiple, fractions, simple equations containing one or more unknown quantities, problems involving equations of the

The College Herd of Purebreds.

"The summer, the divinest summer burns
The skies bright with azure and with gold."—LORD THURLOW.

first degree, and the discussion of such equations. The work in algebra should be of a grade equal to that of Wentworth's New School or Well's Essentials of Algebra.

The examination in English will cover the entire field of grammar, except prosody. In this examination much will depend on the candidate's ability to analyze a passage of good modern prose, and to punctuate his paper correctly. In analyzing he should be prepared to treat phrases and clauses as units, and to state the exact function of conjunctive words. He should show a ready and accurate knowledge of the structure of the prose sentence and the relations of its various parts to one another. For further information, see the sample examination questions in Advanced Grammar, page 33.

Many students will find it exceedingly desirable to begin their work in college in this term. Those who have had considerable algebra in the preparatory school should review its fundamental principles and become acquainted with their application in the wider and more difficult field of college work, and those who have had experience in plane geometry can to advantage supplement such study by a review of some standard text and a thorough drill in the original geometric propositions. The classes in these studies established at the beginning of the spring term furnish an excellent opportunity for students to prepare themselves thoroughly for entering upon collegiate work at the opening of the next school year.

In like manner, students who have completed grammar and have had a high school course in rhetoric have an opportunity in this term to review the principles of style and correct whatever errors they still make in expressing their thoughts. Without a thorough grounding in the principles of style and a considerable degree of accuracy in choosing words and constructing sentences, also in planning and developing paragraphs, it is practically impossible for a student to do creditable work in Freshman English. The majority of those who fail in English, fail because they are not fully prepared to do the work they attempt. In many instances the cause of failure is that the student has not been trained to apply the principles he has recited; properly directed practice in composition is far more important than the mere memorizing of rules and definitions. To begin work in this term would prepare many for a better standing throughout their course than would otherwise be possible.

REQUIREMENTS FOR ADMISSION TO FRESHMAN YEAR.

YEAR BEGINS SEPTEMBER 1, 1903.

The requirements for admission to the Veterinary course are fully specified in the write-up of the Veterinary Course.

The requirements for all courses other than Veterinary Science include either graduation from a High School belonging to the list of accredited schools prepared by the Committee on College Entrance Requirements appointed by the State Teachers' Association, or else approved standings in the studies of the Academic Year and the studies necessary for entrance to the Academic Year. All students, however, must stand examination in English.

For all Engineering Courses, beginning with the fall term 1904, all students will be required to present one year's work in either French or German. This may consist of either one full High School year of five recitations per week or the course in French or German given in the Academic Year. Students who are not able to meet the entrance requirement in French or German, and who are otherwise satisfactorily prepared to enter the college, may be conditioned in this subject and make it up after entering college.

ENTRANCE REQUIREMENTS IN MATHEMATICS.

The examination in plane geometry will be upon the text used by the student. He should be prepared to demonstrate original exercises.

The examination in algebra will cover the following subjects: Fundamental operations, including examples involving the use of literal, fractional and negative exponents; parentheses occurring in terms and factors; factoring; highest common factor and lowest common multiple; fractions; equations of the first degree involving one or more unknown quantities and problems leading to such equations; discussion of the forms $\frac{o}{a}$, $\frac{a}{o}$, $\frac{o}{o}$, etc.; inequalities; involution and evolution of algebraic monomials and polynomials, including the extraction of the higher roots; radicals, including the fundamental operations, rationalization, imaginary quantities, binomial surds and the solution of equations containing radicals; pure and affected quadratics; solution of quadratics by factoring; problems involving quadratics; equations solved like quadratics; simultaneous quadratic equations, and theory of quadratics. Students who have thoroughly mastered these sub-

jects in Wentworth's New School Algebra, Well's Essentials of Algebra or text books of an equal grade and who have carefully reviewed them preparatory to taking up advanced work, ought readily to pass the required examination.

An idea of the quality of work demanded can be gained from the sample examination questions which follow:

1. From $(x-y)mn-(a-b)\ (x+y)^{-8}-5x^2$ subtract $(2b+5a)(x+y)^{-8}-(m+5)x^2-ymn$.

2. Multiply $-8a^3b^{-4}c^r\ (x-y)^{-4}\ (m+n)^c$ by $7a^5b^{-3}c\ (x-y)^7\ (m-n)^c$.

3. Resolve $36a^2c^2-81b^2c^2-16a^2d^2+36b^2d^2$ into 4 prime factors.

4. Find the highest common factor of $6ax^4-2ax^3-2ax^2-2ax-8a$ and $6ax^4-14ax^3+2ax^2+2ax+8a$.

5. Find the sum of the following and reduce the result to simplest form:

$$\frac{2(1-3x)}{(1+x)\ (1+9x)}-\frac{1-2x}{(1+x)\ (1+4x)}+\frac{2}{1+4x}$$

6. Divide $1+\dfrac{4ab}{a^2+b^2-c^2-2ab}$ by $2-\dfrac{a-3b-3c}{a-b-c}$

7. Solve the equation:

$$\frac{x-1}{4}-\frac{1}{8}\left\{\frac{x-5}{4}-\frac{14-2x}{5}\right\}=\frac{x-9}{2}-\frac{7}{8}$$

8. Given $\left\{\begin{array}{l} mx+\dfrac{n}{y}=1 \\ nx+\dfrac{m}{y}=1 \end{array}\right\}$ find x and y.

9. The fore-wheel of a carriage makes 5 revolutions more than the hind-wheel in going 50 yards, and if the circumference of the fore-wheel were increased by one-tenth, and the circumference of the hind-wheel by one-fifth, the former would make 7 revolutions more than the latter in going 198 feet. What is the circumference of each wheel?

10. Expand $(-4a^2x^{-3}-y^2)^{-2}$.

11. Find the cube root of $10x^3+12x^5-1-3x^8-6x^2-12x^4+x^9+3x+6x^7-10x^6$.

12. Find the sum of $\sqrt[3]{54a^{m+6}b^3}$, $\sqrt[3]{16a^{m-3}b^6}$, $\sqrt[3]{2a^{4m+9}}$ and $6\sqrt[6]{4a^{2m}}$.

13. Divide $7a^2b\sqrt[3]{a^2bc}$ by $ab\sqrt[5]{ab^2c^3}$.

14. Find the cube root of $\frac{a}{3}\sqrt{\frac{a}{3}}$

15. Find the square root of the binomial surd, $(a+b)^2-4(a-b)\sqrt{ab}$.

16. Divide $\sqrt{48}-\sqrt{12}$ by $-\sqrt{-6}$.

17. Solve the equation: $\sqrt{3x+\sqrt{3x+13}}=\frac{91}{\sqrt{3x+13}}$

18. A man traveled by coach 6 miles, and returned on foot at a rate of 5 miles an hour less than that of the coach. He was fifty minutes longer in returning than in going. What was the rate of the coach.

19. Solve the equations: $\begin{cases} x^2y^2+28xy-480=0 \\ 2x+y=11. \end{cases}$

ENTRANCE REQUIREMENTS IN ENGLISH.

The applicant should show thorough preparation in English, including grammar and elementary rhetoric, and not over-looking spelling, reading, and punctuation. A student who spells poorly will be conditioned in English courses until he is able to spell with comparative accuracy. The applicant should understand the words in current use in good modern prose, and should be able to read aloud with that ease and fluency that betoken a correct understanding of what he reads. His knowledge of grammar should enable him to classify words according to their grammatical properties, to give their inflections and to identify each form, to analyze in detail sentences of modern prose, and, above all, to construct sentences correctly. He should have given sufficient study to punctuation to enable him to use the marks correctly in his own compositions. His knowledge of rhetoric is best tested, not by his readiness to give definitions, but rather by his ability to apply his knowledge of rhetorical principles in his own speech and composition. His speech should be free from gross errors and awkward constructions, and he should be able to write with a fair degree, not only of correctness. but also of ease. For such training, more depends upon the teacher than upon the text-book, but the method pursued in a book like Scott and Denney's "Composition-Rhetoric" is likely in general to produce the best results.

"Then pealed the bells more loud and deep:
'God is not dead; nor does he sleep!
The wrong shall fail
The right prevail—
With peace on earth, good-will to men.'"

The Campanile.

"Is there a heart that music cannot melt?"—BEATTIE.

An idea of the extent and nature of the ground covered may be gained from the following set of sample examination questions in English:

PREPARATORY GRAMMAR.

(For admission to the first term of the Academic Year).

I. (a) Decline *I, it, lady, dog, Charles.*

(b) Compare noisy, ill, remarkable.

(c) Write the principal parts of *go, see, ride, sleep, try.*

II. Define (a) proper noun, (b) personal pronoun, (c) descriptive adjective, (d) intransitive verb, (e) passive voice, (f) subordinate conjunction.

III. Name the different kinds of nouns, of adjectives, and of pronouns, and give an example of each.

IV. In the following sentence tell what part of speech each word is: "The deacon did not stop to speak to her, but after a moment's thought placed the precious wallet under the pillows."

V. Analyze this sentence: "This act was followed by another moment's reflection, and as the old man turned, his son stood before him in the doorway."

VI. Parse the italicized words: "*These* are not *my books.* I *think they* must belong to *some* of the boys. *What* boys have been *here since* I left?"

ADVANCED GRAMMAR.

(For admission to the second term of the Academic Year).

I. Conjugate *strike* in the present perfect, past, and past perfect tenses of the indicative mood, passive voice.

II. Define (a) personal pronoun, (b) demonstrative adjective, (c) abstract noun, (d) impersonal verb, (e) active voice, (f) indirect object, (g) attribute complement.

III. (a) Name the principal uses of the subjunctive mood. (b) How does it differ in form from the indicative?

IV. (a) Decline *martyr, baby, ox.*

(b) Compare *lazy, industrious, ill.*

(c) Give the principal parts of *throw, lie, lay, sit, set,* and *ride.*

V. Distinguish between *shall* and *will* in (a) the first person, (b) the third person.

VI. Parse the italicized words: "No man ever loved *more than Stanley to look facts* in the face, *and* to know the exact and certain truth. '*Let us be* firmly *persuaded,*' he wrote, '*that* error

is more easily eradicated by *establishing truth, and* darkness most permanently *displaced* by diffusing light'."

VII. In the following sentence state what each phrase modifies and how: "There is no clearer illustration of this love of light than in his eager and impassioned insistence that the revision of the translation of the Bible should have the help of all the best scholarship of England, in whatever creed or church it might be found." Also point out all the modifiers of *insistence.*

VIII. In the following sentence state the office of each clause, and point out the subject, verb, and complement of each: "It is a duty which the people, by the constitution itself, have imposed on the state legislatures, and which they might have left to be performed elsewhere, if they nad seen fit."

IX. Analyze this sentence: "Culture seeks to do away with classes; to make the best that has been thought and known in the world current everywhere; to make all men live in an atmosphere of sweetness and light, where they may use ideas as it uses them itself, freely,—nourished and not bound by them."

X. Punctuate: "I would not perplex a young mind with punctuation as a system or with nice questions between semicolons and colons but every one should at an early age be taught the difference between the period and the comma and the principal functions of each every one should be taught too the great principle that a point serves as a guide to the construction and through the construction to the meaning of the sentence."

ELEMENTARY RHETORIC.

(For admission to the first term of the Freshman Year).

I. In the following sentence, (a) state the exact grammatical office of each phrase; (b) parse the italicized words; (c) account for the punctuation: "*During* the first half century of our national life we *seemed to have succeeded* in an extraordinary degree in *approaching* our *ideal,* in organizing a nation for counsel and co-operation, *and* in moving forward with cordial unison *and* with confident and buoyant step *toward* the accomplishment of tasks and duties upon *which all* were *agreed.*"

II. Correct the following sentences, and explain the correction:

1. John writes as well or better than Henry.
2. Tom was laying on the floor when I come in.
3. He haint got nothing to worry about.
4. If I was him I would of done it long ago.

III. Discuss *fully* and *carefully* four of the following topics:

1. The practical value of rhetoric.
2. The essential qualities of the paragraph.
3. The respective advantages of the short sentence, the long sentence, and the periodic sentence.
4. Define purity, propriety, and precision, and state why each should be observed.
5. The topic sentence; what it is, its position, its value.

IV. Write an essay of from 250 to 350 words on two of the following topics:

1. My reasons for desiring a college education.
2. A striking contrast—persons, places, or things.
3. A trying experience.
4. A visit to ————————.

NOTE—These essays are considered an important part of the examination. They will be graded mainly on diction, sentence structure and connection, and paragraphing. Good penmanship, neatness of manuscript, and correct spelling and punctuation are also important.

ENTRANCE REQUIREMENTS IN HISTORY.

For admission to the work of the First Semester of the Academic Year the student is expected to pass a satisfactory examination in United States history. Standings from the graded schools will be accepted in lieu of the examination. To pursue successfully the work of the First Semester in the Academic year it is expected that the student will have had some drill in the study of historical subjects. This will be determined by the nature of the school work already done.

For admission to the work in history for the Second Semester of the Academic Year, standings in general history from accredited high-schools are accepted in lieu of an examination on the work in history for the First Semester. Such credit is conditional upon the maintenance of a satisfactory grade of scholarship in the advanced work assigned. Should failure result, any portion of the credit allowed may be cancelled or review without credit be required.

Since the text-book in the Second Semester of the Academic Year is largely supplemented by library and written work and other important class exercises, this course must be taken at the College except for those students who have had the equivalent of history as arranged in a fully accredited high-school course.

Pupils from any of the Fully or Partially Accredited schools not graduates may receive credit in the Academic Year, for the work done at the high school, but such credit is conditioned upon

the maintenance of a satisfactory grade of scholarship in the advanced work assigned.

Students from high-schools not accredited, who desire credits for the Academic Year will be expected to pass a satisfactory examination in General History to the Reformation.

ENTRANCE REQUIREMENTS IN FREE-HAND DRAWING.

For admission to the First term of the Academic Year no previous work in drawing is required.

The standings of students from High Schools giving courses in free-hand drawing may be accepted in lieu of the work in free-hand drawing for the first term of the Academic Year.

The work in free-hand drawing of the second term of the Academic Year (for engineering students only) will be required of all entering engineering students who cannot demonstrate proficiency in sketching parts of machines and a knowledge of the principles of projection and of dimensioning, and facility in plain free-hand lettering.

EXAMINATION AT HOME.

The heads of the English, History and Mathematical departments will cheerfully unite with principals of schools in arranging for such examinations in grammar, rhetoric, history, algebra and geometry, as will admit students to our Freshman Class. Candidates can arrange also to have questions for examination sent to County Superintendents or other school officers who are willing to conduct the examination. The papers will be forwarded to the heads of the English, History, and Mathematical departments, who will mark the same and notify the applicant of the record received.

The attention of applicants for admission is particularly called to this arrangement, by which all their entrance examinations can be taken at a convenient place near home.

ADMISSION ON DIPLOMA.

SCHOOLS FULLY ACCREDITED.

The following list of accredited schools has been prepared by the Committee on College Entrance Requirements appointed by the State Teachers' Association. The attention of secondary schools is called to the fact that beginning with this year each school to be accredited must have at least three teachers devoting their time exclusively to High School work. A full and complete list of the rules governing accrediting of High Schools

and the statement of how a High School may become accredited may be found on pages 129 to 133 of the High School Manual issued by the last State Teachers' Association. Copies of this book may be had free of charge on application to State Superintendent R. C. Barrett, Des Moines.

The graduates of fully accredited schools will be admitted to the studies of the Freshman Year, except English, without examination.

In English all new students must take an examination. This examination will consist of two parts: First, a preliminary test of the student's facility and accuracy of expression as indicated by an essay on a familiar topic. Those who pass this test will be assigned to English III on trial for one week, which constitutes the second part of the examination. During this week each student will write a series of exercises and essays designed to test his general preparation in English, including Spelling, Punctuation, Grammar and Elementary Rhetoric. In these tests memorized rules and definitions, mere theoretical knowledge, will count for little; readiness in applying rules and principles is the essential thing. At the end of these tests only those students who have shown sufficient preparation will be permitted to go on.

Students thus admitted will take review work in algebra during the first ten days of the term. All subjects up to and including quadratics will be treated and the ability of the student to demonstrate principles and solve examples and problems will be tested. Satisfactory examination will be accepted in lieu of this review.

At the close of this review students will be assigned to such work in English and mathematics as the professors in charge of these branches shall consider them fitted to undertake. Credits in these branches will be given only as students complete the respective courses set forth in the detailed statement of the work of these departments. A review of one week in plane geometry will be given at the beginning of the second term and assignments in geometry made in accordance therewith.

SCHOOLS FULLY ACCREDITED.

Ackley,
Adel,
Albia,
Algona,
Ames,
Anamosa,
Atlantic,
Bedford,
Belmond,
Boone,

Brooklyn,
Burlington,
Capital Park, Des Moines,
Carroll,
Cedar Falls,
Cedar Rapids,
Centerville,
Charles City,
Cherokee,
Clarinda,
Clinton,
Columbus Junction,
Corning,
Corydon,
Council Bluffs,
Cresco,
Davenport,
Decorah,
Denison,
Des Moines, E.,
Des Moines, W.,
Des Moines, N.,
Dexter,
Dubuque,
Eagle Grove,
Eldora,
Emmetsburg,
Estherville,
Fairfield,
Forest City,
Fort Dodge,
Fort Madison,
Geneseo, Ill.,
Glenwood,
Greene,
Greenfield,
Grinnell,
Guthrie County,
Hamburg,
Hampton,
Harlan,
Humboldt,
Indianola,
Iowa City,
Iowa Falls,
Jefferson,
Keokuk,
Knoxville,
Lake City,
Lamoni,
Le Mars,
Leon,
Manchester,
Manning,
Maquoketa,
Marengo,
Marion,
Marshalltown,
McGregor,
Missouri Valley,
Moline, Ill.,
Montezuma,
Monticello,
Mount Ayr,
Mount Pleasant,
Muscatine,
Nashua,
Nevada,
New Hampton,
Newton,
Odebolt,
Oelwein,
Onawa,
Orange City,
Osage,
Osceola,
Oskaloosa,
Ottumwa,
Perry,
Postville,
Red Oak,
Reinbeck,
Rockford,
Rock Rapids,

Sanborn,
Sheldon,
Shenandoah,
Sibley,
Sigourney,
Sioux City,
Sioux Falls, S. D.,
Spencer,
St. Mary's, Iowa City,
Storm Lake,
Stuart,
Taylorville Tp.,
Taylorville, Ill.,
Tipton,
Traer,
Villisca,
Vinton,
Wapello,
Washington,
Waterloo, E.,
Waterloo, W.,
Waukon,
Waverly,
Webster City,
West Union,
Wilton,
Williamsburg,
Cedar Valley Seminary, Osage,
Charles City College,
Decorah Institute,
Denison Normal School,
Dexter Normal College,
Epworth Seminary,
Howe's Academy, Mt. Pleasant,
Iowa City Academy,
Jewell Lutheran Col., Jewell,
Lincoln Academy, Lincoln, Neb.,
Michigan Military Academy, Orchard Lake, Mich.,
Mt. St. Joseph's Acad., Dubuque,
Sac City Institute,
St. Agatha's Sem., Iowa City,
St. Frances Acad., Council Bluffs,
Washington Academy,
Whittier College, Salem,
Wilton German-English College,
Woodbine Normal School,
Calhoun County Normal School,
Hawarden Normal School.

SCHOOLS NOT FULLY ACCREDITED.

The following list of schools not fully accredited has been prepared by the Committee of the State Teachers' Association. Graduates of these schools will be admitted to the review work of the second term of the Academic Year on presentation of a diploma showing that the candidate has completed one of the long courses. To be entitled to credit in any study of the second term of the Academic Year the student must present to the professor in charge satisfactory evidence of proficiency in that study.

Adair,
Adel,
Albia,
Algona,
Allerton,
Alton,
Ames,
Anita,
Audubon,
Bloomfield,
Boone,
Brighton,
Britt,
Capital Park, Des Moines,

Carroll,
Cedar Rapids,
Centerville,
Chariton,
Charles City,
Charter Oak,
Clarion,
Clearfield,
Clear Lake,
Colfax,
Coon Rapids,
Columbus Junction,
Correctionville,
Corydon,
Council Bluffs,
Creston,
Davenport,
Decorah,
DeWitt,
Des Moines, N.,
Dubuque,
Dysart,
Eldon,
Eldora,
Elkader,
Emmetsburg,
Estherville,
Fairfield,
Farmington,
Fayette,
Fonda,
Fontanelle,
Forest City,
Fort Dodge,
Fort Madison,
Garner,
Geneseo, Ill.,
Glenwood,
Glidden,
Grand Junction,
Greene,
Greenfield,
Grinnell,
Grundy Center,
Guthrie Center,
Guthrie County,
Hamburg,
Hampton,
Hartley,
Holstein,
Hubbard,
Humboldt,
Ida Grove,
Independence,
Jefferson,
Keosauqua,
Kingsley,
Lake Mills,
Lake City,
Lime Springs,
Lyons,
Manchester,
Mapleton,
Marengo,
Marion,
Mason City,
Mechanicsville,
Milton,
Morning Sun,
Moulton,
Mount Ayr,
Muscatine,
Nashua,
Neola,
New Sharon,
North English,
Northwood,
Oak Park, Des Moines,
Odebolt,
Oskaloosa,
Ottumwa,
Pella,
Perry,
Reinbeck,

A College Team.

"So did this horse excel a common one
In shape, in courage, color, pace and bone.

* * *

Broad breast, full eye, small head and nostril wide,
High crest short ears, straight legs and passing strong.

* * *

Look, what a horse should have he did not lack."—SHAKESPEARE.

Riceville,
Richland,
Rolfe,
Sac City,
Shelby,
Shell Rock,
Shenandoah,
Sibley,
Sioux City,
Sioux Rapids,
Springdale,
Springville,
State Center,
Storm Lake,
Tama City,
Taylorville Tp.,
Taylorville, Ill.,
Tipton,
Traer,
Waterloo, E.,
Waterloo, W.,
Waukon,
West Liberty,
Wilton,
Winfield,
Dexter Normal School,
Sac City Institute,
St. Ansgar Seminary,
Wilton German-English College,

HOW TO ENTER THE COLLEGE.

Persons who desire to enter the College as new students should comply with the following directions:

1. Study carefully and comply with the "Requirements of Admission." Then write to the President, asking for a "Card of Inquiry."

2. On receiving this card, write an answer opposite each question, and mail the card to the President. If the answers you give accord with the "Requirements for Admission," a card of introduction will be sent you, which simply entitles you to admission on passing the examination, or giving the required proof of proficiency.

3. Information regarding board and rooms can be secured by writing J. F. Cavell, Custodian, Ames, Iowa.

4. When you arrive at the opening of the term present the "Card of Introduction" at the President's office. You will there be given a card of directions.

5. Students who do not bring certificates of proficiency in the studies required such as meet the approval of the examining committee will need to be examined here. When all the examinations are completed, and your standings therein are marked on your examination card, return it to the President. If you have passed the studies required you will then sign the Students' Record Book and Contract and secure a card of classification, which certifies your admission to the College and assignment to class work.

Your name will be entered at once upon the official class lists and will be included in the roll call the following day. You will be expected to attend thereafter every recitation of the term.

STUDENTS' EXPENSES AND EQUIPMENT.

No charge is made for tuition to Iowa students. To those who come from outside the state $24.00 tuition per year is charged.

The current expenses of students during the year are as follows:

Every student entering College shall, before being classified, pay a—

Janitor fee of.....$5.00

In Margaret Hall and Creamery—

Lighting, heating and incidentals, per week.....$ .55
Room rent, per term..... 3.00
* Hospital fee, per term..... 2.50

In the Cottages—

Fuel, lighting and incidentals, per week.....$ .40
Room rent, per term..... 3.00
* Hospital fee, per term..... 2.50

As security for the payment of bills, students living in the College buildings are required to deposit with the Treasurer $10.00

This deposit will be returned on final settlement at the close of term.

All bills for each month must, without fail, be settled at the Treasurer's office by the second Saturday of the month following.

Students using laboratories in the various departments of the College are required to pay a laboratory fee at the beginning of each term to cover expenses of breakage, etc., thus incurred and the professors in charge require the Treasurer's receipt for such fee before admitting the students to laboratory practice.

For amounts of such fees see department courses.

Students purchasing military uniforms will deposit $5.00 with the merchant tailor at the time measures are taken, paying the remainder on delivery.

For heating, lighting, cleaning and care of the College buildings students pay less than the items actually cost the institution. Injury to College property, of whatever sort, is charged to the author, when known; otherwise to the section or to the entire body of students, as may seem just in the given case.

*See terms of Hospital Department, page 48.

Students who board in any of the College buildings **furnish their own bedding, and all furniture for their rooms,** excepting bedsteads, washstands, tables and wardrobes.

Students are earnestly advised **to make their rooms comfortable and cheerful.** Male students in the two lower classes, not physically disabled, are required by law to take the military drill and purchase uniforms therefor. "Physical disability" must be certified to by the College Physician, on examination.

Text books and stationery may be purchased at the College Book Store, at about twenty-five per cent below the average retail price.

COLLEGE HOSPITAL.

The actual sanitary condition of the College is excellent. The buildings are situated on high ground with good natural drainage. The water supply is exceptionally pure and abundant.

The sewer system and sewage disposal plant are the best that modern sanitary engineering can devise. Nevertheless, in this, as in other like institutions, whose students are drawn from a wide territory, various diseases are brought here by the students themselves. In order to control epidemics and properly care for other cases of illness or injury, a neat and commodious hospital building is provided. This building is heated by furnaces, lighted by gas, and has perfect sanitary plumbing. This hospital is under the charge of the College Physician assisted by a professional nurse and a competent housekeeper.

The expenses of the hospital are defrayed from a fund accruing from hospital fees paid by students.

The hospital fee insures to the payer thereof medical attendance, nursing and medicine in illness or accident and consultation and medicine for minor ailments, in accordance with the regulations published below.

The privileges of the hospital are also extended to students not rooming in the college buildings, provided, 1st, that no calls shall be made by the Physician at their residence, and 2nd, that the usual hospital fee is made within the first ten days of the term. The hospital has proved to be a great blessing to the students and the insurance is placed at actual cost.

The following regulations apply to the privileges of the hospital:

1st. The hospital fee for the term is fixed at $2.50, and is required of all students living in College buildings.

2nd. Students entering the hospital shall be charged $3 per week for board, fires and lights. No other charges on these accounts shall be made by the College during the time the student is in the hospital.

3rd. For any time in excess of three consecutive weeks per term spent in the hospital an additional charge above that mentioned, shall be made of $4.00 per week.

4th. In case a special nurse or physician is employed the expense shall be borne by the particular patient. The selection of such physician or nurse to be approved by the College Physician.

5th. Students not making the hospital deposit will be admitted to all the privileges of the hospital allowed students making the deposit upon the basis of a charge of $10.00 per week.

6th. The College Physician is authorized to exclude from the college dormitories and recitation rooms any person afflicted with a contagious disease.

7th. The privileges of the hospital shall not be extended to cases of small-pox.

8th. The College assumes no responsibility whatever and the hospital fee of $2.50 does not provide for medical attendance, nurses, medicine or other expenses incurred in treating or caring for students afflicted with small-pox.

9th. The President and College Physician shall require of students entering College a certificate of a reputable physician showing a successful vaccination.

10th. The charges named are based upon the probable actual cost of medical attendance and hospital service and the fund created will be carefully devoted to those purposes. The College can not assume any liability beyond the extent of the fund so created.

MANUAL LABOR.

SHOP LABORATORY AND FIELD PRACTICE.

The following regulations in regard to manual labor have been adopted by the Board of Trustees:

1. The manual labor of students is divided into two kinds, viz.: Uninstructive labor, which shall be paid for in money, and instructive labor, which shall be compensated by the instruction given and the skill acquired.

2. Uninstructive labor shall comprise all the operations in the workshop, the garden, upon the farm and elsewhere, in which

the work done accrues to the benefit of the College, and not to that of the student. Instructive labor shall embrace all those operations in the workshop, museum, laboratories, veterinary hospital, experimental kitchen, upon the farm, garden and experimental stations, in which the sole purpose is the acquisition of knowledge and skill.

3. Students shall engage in instructive labor in the presence and under the instruction of the professor in charge according to the statement made in each of the courses of study.

The compensated labor furnished by the Divisions of Agriculture, Veterinary Medicine and of Engineering, is given by each to its own students, and is eagerly sought. The "details" of compensated labor supplied by the needs of the various departments are given to the most faithful and meritorious students in each department. Uninstructive labor is paid for according to its value to the College, but no student should expect to pay the main part of his expenses by labor while here. The College cannot furnish the work, and even if it could, the student's time is *chiefly needed for study*. Still, many worthy and industrious students pay a considerable part of their expenses by labor, over $4,000 being paid out by the College thus each year to students and post-graduate assistants.

GOVERNMENT.

The relations of our college buildings, and the nature of the exercises, complicated as they are, by laboratory work, shop practice and labor, make order, punctuality and systematic effort indispensable. This institution, therefore, offers no inducement to the idler or self-indulgent. All who are too independent to submit to needful authority, or too reckless to accept wholesome restraint, are not advised to come. The discipline of the College is confined mainly to sending away promptly those who prove on fair trial to be of the said class.

The use of tobacco by students on the college premises is forbidden. Those who are already so addicted to its use that they cannot cheerfully submit to this regulation are advised not to come. Of course the use of intoxicating beverages and of profane and obscene language is forbidden.

PUBLIC WORSHIP.

Officers and students gather daily in the chapel at 11:45 A. M., for public worship. On Sunday morning at 10:45 a discourse is given in the chapel by a clergyman invited for the occasion. The

object of these services is to emphasize and enforce the principles of morality and of the Christian religion. Being a state institution we give the utmost freedom to all creeds and forms of belief, avoiding the controversies of sectarianism.

The faculty requires on Sundays such conduct and decorum in and about the college buildings as befit the observance of the Sabbath.

RELIGIOUS ASSOCIATIONS.

The Young Men's and Young Women's Christian Associations of the College are voluntary organizations, composed of students and members of the faculty. The membership is large. The Sunday school, Bible classes and prayer meetings are under their direction, and are well attended and profitable. This voluntary Christian influence in the College is strong and healthful.

LITERARY SOCIETIES.

Seven literary societies hold their meetings each Friday evening, a time kept free from other college functions. These societies supplement the literary work of the College, and besides provide a training in appearing before an audience such as every college graduate needs, a training that is not secured in the class room. Every student is advised to join one of these societies. The societies collectively constitute the Oratorical Association, whose duty it is to provide for four general programs each year; an oratorical contest in the fall term, a declamatory contest in the spring term, and a joint program at the beginning of each term. Six of the societies constitute the I. S. C. Debating League, an organization which arranges for an inter-society debate each term and an annual inter-collegiate debate with the Iowa State Normal School. The inter-society debate calls out twenty-four debaters each term, four from each society, two of whom maintain the affirmative and two the negative of a given question, against opposing teams from other societies.

THE MOORE PRIZE FUND.

To Mr. S. L. Moore, of Boone, the College is indebted this year for a prize fund of one hundred dollars, which has been divided equally between the Oratorical Association and the Debating League.

COURSES OF STUDY.

Courses of study leading to the following degrees are offered:

1. The course in Agronomy.
2. The course in Dairying.
3. The course in Animal Husbandry.
4. The course in Horticulture.

Each of the foregoing is a four years' course leading to the degree of Bachelor of Scientific Agriculture, (B. S. A.).

For the one year course in Dairying certificates properly indicating the completion of certain studies will be given.

SPECIAL LINES OF STUDY.

Students taking special work in any of the College courses must be at least twenty years of age, must give good and sufficient reason for desiring such special classification and must furnish satisfactory evidence that they are thoroughly prepared to pursue the work chosen. Permission to take such special course and the subjects included therein must receive the approval of the President of the College and the Dean or Head of the Department in which the student seeks enrollment.

GENERAL REGULATIONS.

(1) *Back Studies.*—Students shall be classified in back studies in all cases where such studies are taught. Any exception to this rule must be for good and sufficient reasons approved by the President of the College and the Dean or Head of Department in which the student is enrolled.

(2) *Number of Hours.*—No student shall be allowed to classify in more hours than are specified in the catalog for the term of the course taken unless he has an exceptionally high record in his previous college work and gives satisfactory reason for desiring to take the additional study. The taking of such additional work is subject to approval by the President of the College and the Dean or Head of the Department in which the student is enrolled.

(3) *Conflicts.*—Students shall not classify in conflicting studies without the approval of the President of the College and the Deans or Heads of departments of the conflicting studies in which the student wishes to enroll.

GRADUATING THESES.

The subjects of theses shall be selected under direction of the professor in whose department they are written, and submitted to the Thesis Committee, with signed approval of the Professor, on or before the first Monday in October.

It is expected that each thesis shall represent an amount of work equivalent to at least one exercise per week through the Senior Year; that it shall show the result of the student's personal study or investigation and be throughout original in matter and treatment so far as the nature of the subject will permit; that it shall be prepared under the supervision of the professor in charge, the student making frequent reports of progress and having an outline of matter ready for approval by the first week of the last term.

The thesis, ready for examination and marking, with its specific title and the written approval of the professor in charge, shall be presented to the Thesis Committee at a date fixed by the committee during the four weeks preceding the Commencement Day.

ADMISSION TO ADVANCED STANDING.

Graduate and undergraduate students of other colleges will be admitted and granted such credits as their work will justify. Work of recognized merit that has been taken at colleges or universities of good rank and standing will be credited for an equivalent amount of work so far as it applies in any of the courses offered at this college. Students taking up work in this way will consult the heads of departments to ascertain the credits to be allowed; these credits may at the option of the head of the department be conditioned on satisfactory work during the student's first term in College.

GRADUATE COURSES.

The advanced degrees which are conferred by the faculty of this college are as follows:

1. The degree of Master of Scientific Agriculture (M. S. A.) is open to Bachelors of Scientific Agriculture who are graduates of this college or other colleges offering equivalent courses of study.

"A farmer cannot be over-educated, if his education is of the proper kind."—PROF. DOYLES A. GILCRIST.

Cattle and Horse Barns.

REGULATION FOR MASTER'S DEGREES.

1. The opportunity of resident study after graduation is a privilege granted only upon recommendation of the President and the Professors in charge of the departments in which the studies are to be pursued.

2. Between the baccalaureate degree and the master's degree there shall intervene not less than two years, of which the candidate shall devote not less than one year (the second preferred) to resident study at this College.

3. Two lines of work shall be selected, designated as major and minor studies, the former to be given two-thirds and the latter one-third of the time. The major study shall be research work, the results of which shall be incorporated in a thesis.

4. The major and minor studies shall be so selected as to support and strengthen each other.

5. No undergraduate study shall be selected as a major study.

6. The candidate shall have a reading knowledge of French or German.

7. Applications for graduate work shall be filed with the President not later than October first. Such application shall contain a detailed outline of the major and minor studies, approved by the heads of the departments in which the work is to be taken.

8. The candidate for the master's degree shall apply in writing for examinations not later than May 1, and such examination shall be given not later than May 15th.

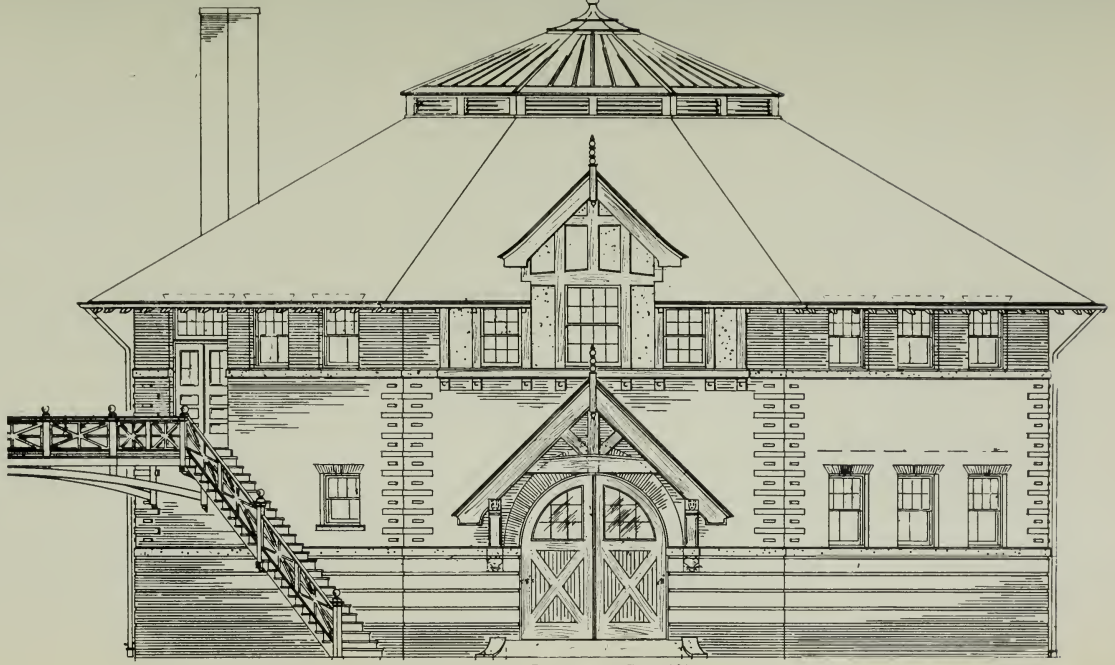
9. Graduates of other institutions desiring to become candidates for Post-Graduate degrees in this institution shall be required to show to the Committee on Post-Graduate study evidence of undergraduate work equivalent to the corresponding course in this institution, and if any deficiency appear in the subjects elected for Post-Graduate work to make up such deficiency.

Further information as to the lines of work open to graduate students can be found under the several courses of study described elsewhere.

"When labor and thought are linked together in every phase of our industrial life we shall have less grit in the machine and more gold in its product.—Hon. H. C. Adams.

"Education is a better safe-guard of liberty than a standing army." —EDWARD EVERETT.

"The greatest nations of Europe strain every effort to make science the handmaid of war. Let it be the glory of the great American people to make science the handmaid of agriculture." HON. JERRY RUSK, EX-SECRETARY OF AGRICULTURE.



The New Judging Pavilion.

COURSES OF STUDY

The instruction in agriculture is divided into the following departments:

I. Department of Agronomy.
II. Department of Dairying.
III. Department of Animal Husbandry.
IV. Department of Horticulture.
V. Department of Agricultural Chemistry.

The courses in these several departments unite in making a foundation for the student upon which he can build a successful career as a farmer, or develop into a specialist in the many possible lines that are branches of the farming industry. The studies pursued in each department are equally recognized as being necessary to fully equip the student for the highest order of work in any division of agriculture, and the only difference between the shorter and the longer courses is due to the degree to which the student wishes to specialize and develop himself for a single line of work. The farm as it is commonly conducted is a union of many divisions of industry and the shorter course confines itself to laying a foundation that will secure success in all of these, while the longer course seeks to direct the student into that line which will call forth and centralize his special ability and at the same time enable him to meet the variety of conditions that under all circumstances surround a successful life.

Past experience with the courses of these departments shows that they have met with more than the usual success in attaining their objects; as the shorter course has been productive of many successful farmers, and the longer course has been unusually successful in developing better farmers and more capable men in practical life and also in securing for our graduates prominent positions in the agricultural faculties of other colleges.

In practical agriculture, a field unsurpassed by any other college in the United States is open to the students. The national government gives to the college about thirty-five thousand dollars annually for original experimentation and instruction in agriculture and the sciences related to the industries. This enables the college authorities to make the fields and the barns veritable laboratories of extensive and most practical investigation and observation. The range is from the soil that produces,

through all of its natural characteristics, to whatever is grown in agriculture from germ to finish. A live stock room is set apart in Agricultural Hall in connection with one of the best recitation rooms, into which live animals are brought in the presence of the teacher and the class for careful study and intimate knowledge, and a commodious, well-lighted stock judging pavilion has been constructed especially for this work. An experimental barn with the recent and most approved methods of stalls, feeding and ventilation, is devoted exclusively to the original work of animal husbandry. This work ranges over all the questions of breeding and maturing domestic animals.

The agricultural school is designed to teach the sciences that underlie practical agriculture, and sufficient English literature, mathematics, history, and other supplementary studies to sustain both scientific and practical agriculture and to develop the agricultural students to the intellectual level of the educated in any profession. Special attention is given to the improved methods in all of the various operations of farming, farm building, using tools and machinery, and management of all kinds of stock and crops. The instruction of this department embraces principles and practice of agriculture.

The farm consists of 800 acres of rolling prairies, bottom, and woodland, and is stocked with good representatives of six breeds of horses, six breeds of cattle, seven breeds of sheep, and six breeds of hogs. These animals are used in class illustration and for the various experiments in breeding and feeding for milk, meat, wool, growth and maintenance, conducted by the Experiment Station as a department of the College. All the crops of the farm are grown for some educational purpose; all the animals are fed by rule and system, and the result of their management reported upon, and used in class work. Labor is not compulsory, but students in the agricultural course are given work that is educational and parallel with their studies. Some students pay for their board by work in the mornings and evenings. Under direction of the professor in charge, students assist in conducting experiments in lines related to their studies.

"Who hath a ploughland casts all his seed corn there,
And yet allows his ground more corn to bear."—JOHN DONNE.

A Class in Corn Judging.

"Man is as much made for education as the earth is for cultivation."—B. SEARS.

DEPARTMENT CF AGRONOMY

PERRY G. HOLDEN, PROFESSOR; W. H. STEVENSON, SOILS.
W. H. OLIN, ASSISTANT IN FARM CROPS; ALFRED ATKINSON, ASSISTANT IN FIELD EXPERIMENTS.

Agronomy is the science of the field and its crops, and treats of (a) Farm Management; the application of economic business methods to farm practices. (b) Farm Crops; their production and improvement. (c) Soils; their fertility, cultivation, and improvement. (d) Farm Mechanics; the tools, machinery, fences and drains of the farm.

COURSE I.—*Farm Crops*; *Corn and Grain Judging.*—Corn judging includes: 1. The practical work of judging representative samples of the varieties of corn with the use of the score card and standards of perfection. 2. The study of the physical characteristics of seed ears; the selection of seed for special purposes; methods of harvesting, sorting, storing, testing and planting seed corn. 3. A series of recitations covering the adaptations of varieties of corn to conditions of soil and climate, preparation of seed bed, cultivation, methods of harvesting, cost of production, and uses of crop.

Grain grading includes: 1. Practice in grading samples of corn, wheat, and other grain crops according to inspectors' and buyers' standards. 2. A series of recitations upon the extent and cost of production, and the distribution of these crops.

Freshman year. First term. ———— and Mr. Olin.

COURSE II.—*Farm Mechanics*; *Farm Buildings*; *Farm and Field Machinery.*—The location, arrangement of farm buildings, their construction and cost, especially of barns, granaries, silos, etc. The different kinds of fences, their cost, construction, efficiency for different purposes, and desirability. The setting and testing of fence posts, gate posts, and the operating of fence building machines. The course in field machinery includes a study of the tools and machinery for field operations. Plows, harrows, and weeders; seeders, drills, corn and potato planters; mowers, rakes, binders, huskers, wagons, etc. Their construction, efficiency, draft and durability. Class and laboratory work consists in setting up, adjusting and testing the different farm machines and implements of the field. Freshman year. Second term.

COURSE III.—*Farm Crops; Crop Production.*—This term's work consists in a study of the field crops of the farm. It embraces the study of the principles underlying their propagation, germination, and growth.

Time and methods of planting, conditions favorable and unfavorable to plant growth; effects of thick and thin seeding, depth of planting; study of root systems of our different soils.

Noxious Weeds: How to destroy them through different methods of plowing, cultivation, rotation of crops, etc.

Injurious Insects: Time of plowing, methods of cultivation, and kinds of rotation as means of lessening effects of.

Fungous Diseases: Methods of treating farm seeds as a means of controlling the loss from these diseases.

Shrinkage of corn and other grains.

Data on crop production.

Harvesting and storing, economic use and value of the various crops of the farm.

This work will be supplemented by laboratory and field work applying the principles brought out in the class room work.

Required. Agronomy I. Sophomore year. First Term. Mr. Olin and ————————.

COURSE IV.—*Farm Mechanics; Farm Power Machinery, and Drains.*—The object of this work is to familiarize the student with the principles of the different machines used on the farm; and includes a study of gasoline engines, wind mills, pumps, feed cutters, grinders, corn shellers, fanning mills, and other machines. Attention is given to the handling of these machines to secure the greatest efficiency. Care of machinery, housing, repairing, etc. Under drainage is studied, location of drains, and a study of the different problems arising in the laying out of drains and drainage systems. A study of the legal questions arising in the establishing of drainage districts. The levelling, including the determining of grades, making of profile maps, and a complete record of the drains of the farm. Digging, laying of tile, filling of ditches, and subsequent care of drains. The cost, construction, and efficiency of tile drains; sewers for the disposal of waste water from farm buildings. Class and laboratory work.

Those students who are fitted for the work will have an opportunity during the summer vacation to earn from $40.00 to

$60.00 per month, travelling in the interests of harvester and other manufacturing concerns.

Required. Agronomy II. Sophomore year. Second term.

Course V.—*Soils; Soil Physics.*—This course comprises a study of the origin, formation and classification of soils; soil moisture and methods for conserving it; soil temperature, and conditions influencing it; soil texture as affecting the supply of heat, moisture and plant food; surface tension, capillarity, osmosis, and diffusion as affecting soil conditions; the effect upon the soil and the crop of plowing, harrowing, cultivating, rolling and cropping; washing of soils and methods of preventing the same; preparation of seed beds, cultivation and drainage as affecting moisture, temperature, root development, and the supply of available plant food.

The work of the class room is designed to give the student an opportunity to study the different methods of handling soils and the effects of these methods upon the moisture, temperature, texture, and productiveness of the soil.

In addition to the work of the class room several hours each week throughout the term will be devoted to laboratory work.

Special attention will be given to the mechanical analysis of soils by the centrifugal method employed by the Bureau of Soils, U. S. Department of Agriculture. The work will also comprise the determination of the specific gravity, apparent specific gravity, volume, weight, porosity, water holding capacity, and capillary power of various soils; also a study of the effect of mulches on the evaporation of water from the soil and the physical effects upon the soil of different systems of rotation and of continuous cropping. Junior year. First term. Professor Stevenson.

Course VI.—*Soils; Fertility.*—Maintanence of Fertility, Fertilizers and Rotation. The influence of commercial fertilizers, barn yard manure, and green manuring upon the quality and yield of various crops; the effect of different crops upon the fertility of the soil and upon succeeding crops.

Different systems of rotations and the effect upon the production of the soil of various methods of farm management. Also a study of the storing, preserving and application of barn yard manure.

This work will be supplemented by a laboratory study of manures and fertilizers; their composition and agricultural value. Pot and field experiments will be conducted to show the influence of fertilizers, applied to the soil in different quantities and at

different times, upon the quality and yield of various crops. Leguminous crops as fertilizers and their place in farm rotation. A study will be made of special types of soil in different sections of Iowa, such as the clay and peat soils of Iowa with special reference to the best methods of handling and cropping these soils. Required. Agronomy V. Chemistry III. Junior year. Second term. Professor Stevenson.

COURSE VII.—*Research Work.*—The student may choose any one of the following lines of work:

(a) *Special Work in Soil Physics.*—This course is offered for students who desire to pursue advanced work in the study of the physical properties of soils.

Apparatus for the determination, by electrical methods, of the temperature, moisture and soluble salt content of various determinations under actual field conditions.

The organic content of soils will be determined by the process used by the Bureau of Soils, U. S. Department of Agriculture.

When possible field experiments will be conducted to show the effect upon soil conditions of different depths of plowing, harrowing, cultivating, rolling, fallowing, and different methods of preparation of seed beds.

A study will be made of the physical properties of peculiar types of soil found in the state and of methods for redeeming them and rendering them productive. Professor Stevenson.

(b) *Special Problems Regarding the Fertility of the Soil.*—This course is designed for students who desire to continue their investigation of the soil. Problems of special interest regarding the fertility and productiveness of particular types or classes of soils will be studied. The nature and quantity of the elements of fertility in the soils investigated will be determined and pot cultures and plot experiments will be conducted to show the effect upon the growth and yield of various crops, of different fertilizers added to the soil.

This work will be supplemented by assigned readings. The student will study the results published by authorities on these lines of investigation and will also present in written form the results of his own investigations and experiments. Professor Stevenson.

(c) *Research Work*; *the Improvement of Farm Crops*; methods of selection and hybridization; effects of inbreeding and crossing; plans for breeding fields; methods of taking records and recording pedigrees; methods for testing vitality and purity

Main Work Room of Creamery.

"Children in dairy countries, do wax more tall than where they feed upon bread and flesh."—BACON.

of seeds; a study of the organs of reproduction with special regard to their arrangement for cross or close pollination; the study of the results of experiments in crossing and selection and other means of improvement. Mr. Olin.

(d) *Special Crops.*—Research work with special crops under the outline of grain, forage, root, fibre, and other crops produced for special purposes. This course is arranged so as to permit the student to specialize and pursue independent investigations with those crops in which he is particularly interested. The recitations will cover the distribution, development of varieties, details of methods of production, special methods of preparation or manufacture, and uses. The laboratory work will consist of a series of special experiments in the green houses or fields, arranged for each student. These experiments will be planned, carried out, and the results presented in acceptable form by the student. This work will be supplemented by a study of previous experiments and the preparation of bibliography of such work. Second term. Third year, and First term, Senior year. Mr. Olin and ————————.

Course VIII.—*Farm Management.*—This consists of a study of the different systems of extensive and mixed farming; the application of business methods to farm operations; comparison and study of methods pursued by our most successful farmers; division of the farm into fields and crop management; circumstances that influence agricultural practices—soil, climate, machinery, land, tenure, etc., markets, profits, and losses; executive and commercial problems on large and small farms,—management of farm help; amount of fencing, number and character of live stock as affecting the economic management of the farm; relation of farming to other occupations; qualifications and requirements for the farm manager. First term. Senior year. Professor Holden.

Course X.—*History of Agriculture.*—A study of the development of the agricultural methods and practices of those nations which have contributed most to the progress of agriculture; the influences of these methods and practices upon the agriculture of the present day. A comparison of agricultural methods of other countries with those of our own country and the influence of different practices upon the social conditions of the people.

GRADUATE WORK IN AGRONOMY.

I. *Farm Crops.*

1. Breeding of Special Forage Crops.

2. Breeding of Cereals.

3. Breeding of Root Crops.

4. Study of the economic methods of growing and handling our various Farm Crops.

5. Caring for, storing, testing, and marketing our farm seeds.

II. *Farm Mechanics.*

1. Investigation of the draft of different farm implements; effect of good and bad adjustment of different tools upon the power required for efficient work.

2. Study of Silos.

3. Experiments with different kinds of cultivators for different purposes.

4. Study of different kinds of fences with special reference to their efficiency for special purposes.

5. The study of harvesters and mowers.

6. Special study in the construction and arrangement of barns.

This work is designed especially for those who wish to fit themselves for foremen, superintendents, etc., in connection with farm proprietors, manufacturing, and implement concerns.

III. *Soils.*

1. Study of soils fitting for special work in U. S. Bureau of Soils, College and State Experiment Station work.

The post-graduate work in soils will consist in the study of special lines of investigation in soil physics, and soil fertility, and soil bacteriology.

IV. *Farm Management.*

1. Special investigation of some of the most serious wasteful practices of the farm; how to remedy them.

2. Special business methods for special farm conditions.

3. Special vs. mixed farming.

4. Investigation of methods practiced by farmers in keeping a record of the elements of loss and gain on their farm, bibliography to be completed showing resulting losses and remedies suggested.

This work is designed to prepare young men for farm managers, and superintendents for both large and small farms. There is a constant demand for competent men for such positions.

"The earth is a machine which yields almost gratuitous service to every application of intellect.—EMERSON.

Experiment Station Plats.

"It will be a country story—full of the breath of cows and the scent of hay."—GEORGE ELIOT.

SHORT COURSE IN CORN JUDGING, 1904.

January 4 to 16.

During the winter vacation a two weeks' course in corn judging will be given. This course is planned with special reference to supplying the great demand for work along this line by those who are unable to take advantage of the work in the regular College course. A two story corn and stock judging pavilion is now being erected for this work. Instruction will be given in the methods of selecting, storing, purchasing, testing, and preparation of seed corn for planting. Instruction will also be given in the methods of cultivation, characteristics, and adaptability of different varieties to various sections of the state. A comparison of the efficiency of all the different makes of planters and cultivators will be made.

Samples of all the leading varieties of corn from the corn breeders of this and other states will be on exhibition and will be used for corn judging purposes. This immense collection of corn representing every county in the state will afford an unusual opportunity to compare the different varieties and study their characteristics. Premiums amounting to over $2,400.00 will be offered for the best corn exhibited by members of the Corn Growers' Association and for those doing the best work in corn judging. Those wishing to become corn judges, qualified to judge corn at county fairs and expositions will have an opportunity at this corn school to prepare themselves for the work. An examination will be held at the close of the school and corn judging certificates will be issued by the Corn Growers' Association to those who prove themselves proficient. To partially cover the expense of additional instructors and facilities for judging and demonstration a tuition fee of $2.00 will be charged but one fee will cover the instruction in both stock and grain judging.

The work during this course will be so arranged that the students' time will be divided equally between corn and stock judging.

PREMIUMS FOR CORN.

COOK TROPHY—$400.

Mr. A. E. Cook of Odebolt, Iowa, will present a trophy costing not less than $400 to be competed for annually and awarded to the person exhibiting the Grand Champion sweepstake ear of corn.

WHITING TROPHY—$400.

The Hon. W. C. Whiting, World's Fair Commissioner of Agriculture for Iowa offers a $400 trophy for the Grand Champion sample of 10 ears of corn.

WALLACES' FARMER TROPHY—200.

The Wallaces' Farmer offers a $200 challenge trophy for the Grand Champion sample of 10 ears of corn exhibited by any Farmers' Club, Farmers' Institute or Corn Club.

HOMESTEAD PREMIUM—$100.

The Iowa Homestead has placed at the disposal of the Iowa Corn Growers' Association $100 in gold to be awarded for the best corn and the best corn judging work.

FARMERS' TRIBUNE TROPHY—$100.

The Farmers' Tribune offers a $100 trophy for the person winning first place in the corn judging contest.

IOWA SEED COMPANY SPECIAL PREMIUMS—$50.

The Iowa Seed Company will give two cash specials; one for the best sample of Iowa Silver Mine, $25; one for the best sample of Golden West, $25; exhibited in any of the other classes.

These, together with the many other premiums offered, amount to over $2,400.00. The contest will be held at the Agricultural College annually during the two weeks' short course in corn and stock judging.

For further information regarding rules governing the contest address the Agronomy Department of the Agricultural College.

COURSE IN AGRONOMY.

ACADEMIC YEAR.

FIRST TERM.

Algebra, 5	(Mathematics, I.)
English, 5	(English, 1.)
History, 5	(History, I.)
Elocution, 2	(Elocution, I.)

SECOND TERM.

Advanced Algebra and Plane Geometry, 5	(Mathematics, XIII.)
Elementary Botany, 2	(Botany, I.)
Elementary Rhetoric, 5	(English, II.)

History, 4 (History, II.)
Elocution, 1 (Elocution, II.)

FRESHMAN YEAR.

FIRST TERM.

Live Stock and Score Card Practice, 2 (Animal Husbandry, I.)
Market and Home Gardening, 2 (Horticulture, IH.)
German, 5, *or* (Language, V.)
French, 5 (Language, I.)
Corn and Grain Judging, 5 (Agronomy, I.)
Advanced Rhetoric, 5 (English, III.)
Composition, 1 (English IX.)
Military, 2 (Military, I.)
Library Work, 4 hours per term.

SECOND TERM.

Live Stock and Score Card Practice, 2 (Animal Husbandry, II.)
Plant Propagation and Small Fruits, 3 (Horticulture, IIH.)
Solid Geometry and Trigonometry, 4 (Mathematics, XVII.)
German, 5, *or* (Language, VI.)
French, 5 (Language, II.)
Farm Mechanics, 5 (Agronomy, II.)
Entomology, 2 (Zoology, I.)
Military, 2 (Military, II.)

SOPHOMORE YEAR.

FIRST TERM.

Farm Crops, 5 (Agronomy, III.)
Pomology, 3 (Horticulture, IIIH.)
Live Stock and Score Card Practice, 3 (Animal Husbandry, III.)
Chemistry, 5 (Agricultural Chemistry, XXI.)
Meteorology, 3 (Geology, I.)
Composition, 1 (English, V.)
Military, 2 (Military, III.)

SECOND TERM.

Farm Mechanics, 5 (Agronomy, IV.)
Live Stock and Score Card Practice, 4 (Animal Husbandry, IV.)

Agricultural Geology, 3	(Geology, IX.)
Histology, 4	(Botany, III.)
Chemistry, 5	(Agricultural Chemistry, XXIII.)
Composition, 1	(English, VI.)
Military, 2	(Military, IV.)

JUNIOR YEAR.

FIRST TERM.

Soils, 5	(Agronomy, V.)
Chemistry, 4	(Agricultural Chemistry, XXV.)
Farm Dairying, 2	(Dairying, XII.)

Elective.

Histology, 2	(Veterinary Science XXXIII.)
Comparative Physiology, 1	(Veterinary Science, XXI.)
Surveying, 4	(Civil Engineering, VIII.)
Photography, 2	(Physics, IX.)
Physical Laboratory, 1 *or* 2	(Physics, XIV.)
Economic Entomology, 5	(Zoology, IV.)
Geology, 5	(Geology, II.)
Political Economy, 5	(Economic Science, I.)
English Literature, 3	(Literature, 1.)
Debating, 1	(English, VII.)
Elocution, 2	(Elocution, III.)
German, 5, *or*	(Language, V.)
French, 5	(Language, III.)
Principles of Breeding, 2	(Animal Husbandry, VIII.)
Military Science, 1	(Military, V.)
History of Agriculture, 5	(Agronomy, X.)
History, Mediaeval Institutions, 3	(History, V.)
History, French Revolution, 2	(History X.)

SECOND TERM.

Soils, 5	(Agronomy, VI.)
Research Work, 2	(Agronomy, VII.)
Bacteriology, 2	(Botany, VII.)

Elective.

Comparative Physiology, 1	(Veterinary, XXII.)
Forestry, 3	(Horticulture, VIH.)
Public Speaking, 1	(Elocution, VIII.)

"In those vernal seasons of the year, when the air is calm and pleasant, it were an injury and sullenness against nature not to go out and see her riches, and partake of her rejoicing with heaven and earth "—MILTON.

"All out-of-doors is instinct with growth. You expand your lungs; you swing your arms; you run and leap like a vigorous child; you look; you see; you aspire; you will; you grow a cubit in stature."—BEARDSHEAR.

Roads and Pavements, 2 (Civil Engineering, XIII.)
Vegetable Cytology, 3 *or* 5 (Botany, XII.)
Histology, 4 (Botany, III.)
Mineralogy, 4 (Geology, VI.)
Finance, 3 (Economic Science, V.)
Money and Banking, 2 (Economic Science, IV.)
English Literature, 5 (Literature, II.)
Elocution, 2 (Elocution, IV.)
French, 5, *or* (Languages, II.)
German, 5 (Languages, VI.)
Debating, 1 (English, VIII.)
Improvement of Farm Crops (Agronomy, X.)
Military Science, 1 (Military, VI.)
History, Europe in the 16th, 17th and 18th Centuries, 3.. (History, VI.)
History, Europe since 1850, 2 (History, XI.)

SENIOR YEAR.

FIRST TERM.

Research Work, 2 (Agronomy, VII.)
Farm Management, 5 (Agronomy, VIII.)
Chemistry, 4 (Agricultural Chemistry, XXVII.)

Elective.

Dairy Bacteriology, 3 (Dairying, XVII.)
Butter Making, 3 (Dairying, XIV.)
Comparative Physiology, 2 (Veterinary Science, XXIII.)
Advanced Entomology, 3 *to* 5 (Zoology, IX.)
Geology, 5 (Geology, II.)
Political Economy, 3 (Economic Science, III.)
History Political Economy, 2 (Economic Science, II.)
Psychology, 5 (Philosophy, I.)
Fiction, 3 (Literature, III.)
Elocution, 2 (Elocution, V.)
Oration, 1 (Elocution, IX.)
French, 4, *or* (Languages, III.)
German, 4 (Languages, VII.)
History, Development of the United States, 3 (History, III.)
History, Reconstruction and the Constitution, 2 (History, XII.)
Landscape Gardening, 2 (Horticulture, VIIIH.)
Military Science, 1 (Military, VII.)

SECOND TERM.

Animal Nutrition, 5	(Animal Husbandry, VIII.)
Thesis Work, 2	(Agronomy, IX.)

Elective.

Dairying, 3	(Dairying, I.)
Cheese Making, 3	(Dairying, XV.)
Comparative Physiology, 2	(Veterinary Science, XXIV.)
Technology of Milk, 1	(Dairying, XVI.)
Advanced Entomology, 3 *or* 5	(Zoology, IX.)
Advanced Bacteriology, 3	(Botany, VIII.)
Geology, 5	(Geology, IV.)
Ethics, 3	(Philosophy, II.)
American Literature, 3	(Literature, IV.)
Elocution, 2	(Elocution, VI.)
History of Civilization, 3	(History, IV.)
The Far Eastern Question, 2	(History, IX.)
Astronomy, 5	(Physics, VIII.)
Chemistry, 5	(Agricultural Chemistry, XXVII.)
Military Science, 1	(Military, VIII.)

DEPARTMENT OF DAIRYING.

GEO. L. M'KAY, PROFESSOR.
F. W. BOUSKA, INSTRUCTOR IN DAIRY BACTERIOLOGY.
C. LARSON AND DE LA SHELDON, INSTRUCTORS.

The magnitude and rapidly changing conditions of the dairy industry render a higher degree of skill and intelligence in this field imperative. No branch of education has proven more popular or productive of better results than the instruction furnished in the economical production of a superior class of dairy products. From the fertile farming lands of the Central West annually come one hundred or more young men to be trained in special work in our dairy school. That these young men become leaders wherever they take up work is shown by the responsible positions they are holding at high salaries in dairy communities everywhere, and the many prizes won in state and national conventions. Even the city milk supply business is calling for scientifically trained men who thoroughly understand the essential regulations for proper sanitation and cleanliness, pasteurization and sterilization.

In order to meet the demands of such instruction the Dairy School provides two sixteen weeks courses; one for butter and one for cheese making, beginning with the regular college terms, and a one year course beginning with the college year. Also a two weeks' course in sarters and cream ripening, especially designed for experienced makers, commencing January 4, 1904.

The College Creamery is in operation the year round. The work is conducted on a practical and commercial scale as well as for scientific investigation and instruction. The product made invariably brings the highest quotations and has attained an enviable reputation in the markets of the United States and England.

The facilities for teaching dairying in a thoroughly practical and scientific manner are unexcelled. The building is exceptionally well equipped for practical work as well as scientific instruction and investigation. It is more than a "dairy building" as the term is generally understood. It is a practical working creamery and cheese factory, in operation every work day in the year. During the summer season from five to ten thousand pounds of milk are taken in daily and manufactured into butter and cheese; during the winter somewhat less. The milk is purchased from

farmers living in the vicinity of the College and they are paid for it according to its merits, based not only on butter fat determined by the Babcock test, but upon inspection of its cleanliness, freedom from all taints, objectionable odors and other general qualities. A bacteriological laboratory, forms facilities for instruction and investigation in this important feature of the subject.

The student becomes familiar with everything connected with the management of a commercial creamery, and meets every problem that is likely to confront him in his afterwork. All leading types of separators are used in the dairy building and the most approved machinery is used throughout by the students.

The work done in dairying by the students in the four years course in agriculture is outlined in the course of study. They not only become familiar with the work in the creamery, the cheese factory and the private dairy, but study the underlying principles of the whole subject in the broadest sense. The College dairy herd, consisting of thirty or forty cows, regularly in milk, affords opportunity for the study of dairy as well as creamery problems. These cows are milked and cared for mainly by student help under the direction of instructors.

During the latter part of the senior year those students who have shown themselves capable, are permitted to spend a portion of their time in the laboratory in original work, and meritorious work of this kind is reported in the bulletins of the Experiment Station.

The courses in dairying were established for the benefit of those who were already engaged in the business, either on the farm or in the creamery or factory, and for this reason a very large portion of the time is devoted to practical work in the dairy building.

Students in these courses are taught everything connected with practical work, from weighing the milk brought in by the different patrons and testing the same, to running the engine, scrubbing the floors and shipping the butter. The aim is to teach not only how to do all the work incident to a business of this kind, but also why,—the reason,—the work should be done in the manner taught. The studies, other than dairying proper, which appear in the courses outlined are such as are necessary to a correct understanding of the principles involved, and all students entering these courses are required to attend them regularly.

Students in all of the Dairy and Creamery work are required to provide themselves with white suits, keep them clean and in good order.

ONE YEAR COURSE IN DAIRYING.

The one year course in dairying is designed to meet the wants of those who wish to acquire an intimate knowledge of practical dairy methods and the underlying principles as well as to the sciences related thereto. This course runs through one college year beginning in January and ending in December. Students completing this course will receive certificates, but the right is reserved to withhold such certificates until satisfactory evidence is furnished of ability to successfully manage commercial creameries or other large dairy establishments for at least one year. No other certificates will be given for any course in dairying except to students entitled to a diploma for the four years' course in Agriculture. (See note at bottom of page). Following is the course of study pursued:

FIRST TERM OF NINETEEN WEEKS.

Dairy Practice in butter making, 6 days per week.—(Dairy I.)
Buttermaking, 16 Lectures.—(Dairy II.)
Milk Testing, 16 Lectures.—(Dairy III.)
Dairy Machinery, 16 Lectures.—(Dairy IV.)
Book-keeping, 16 Lectures.—(Dairy V.)
Bacteriology of milk, 20 Lectures.—(Dairy VI.)
Feeding and Judging Dairy Stock, 30 Lectures.—(Dairy VII.)

SECOND TERM OF SIXTEEN WEEKS.

Preparation of Ice Cream and Ices, 10 Lectures.—(Dairy XXI.)
Dairy Practice, 6 days per week.—(Dairy I.)
Cheesemaking, 16 Lectures.—(Dairy VIII.)
Technology of Milk, 16 Lectures.—(Dairy IX.)
Feeding Dairy Stock, 20 Lectures.—(Dairy X.)
Dairy Chemistry, 16 Lectures.—(Dairy XI.)
Scoring Butter and Cheese, 10 Lectures.—(Dairy XII.)

NOTE—Students taking the one year course in dairying must be qualified for work in the collegiate department and will be expected to furnish satisfactory evidence of a thorough knowledge of all branches taught in the common school.

THE SUMMER SCHOOL IN DAIRYING.

While we earnestly advise those who expect to work in dairy lines, either on the farm or in the creamery or factory to take the one year course in Dairying as outlined above we realize that there are many who for various reasons are unable to do this. Believing that a state institution should offer every possible encouragement to those who desire to fit themselves to do their chosen work in the best manner, a Summer School in Dairying is thrown open to students. This school begins in January and continues sixteen weeks. The same studies are pursued in this as in the One Year Course:

Dairy Practice, 6 half days per week.—(Dairy I.)
Buttermaking, 16 Lectures.—(Dairy II.)
Milk Testing, 16 Lectures.—(Dairy III.)
Dairy Machinery, 16 Lectures.—(Dairy IV.)
Book-keeping, 16 Lectures.—(Dairy V.)
Bacteriology of Milk, 20 Lectures.—(Dairy VI.)
Feeding and Judging Dairy Stock, 32 Lectures.—(Dairy VII.)

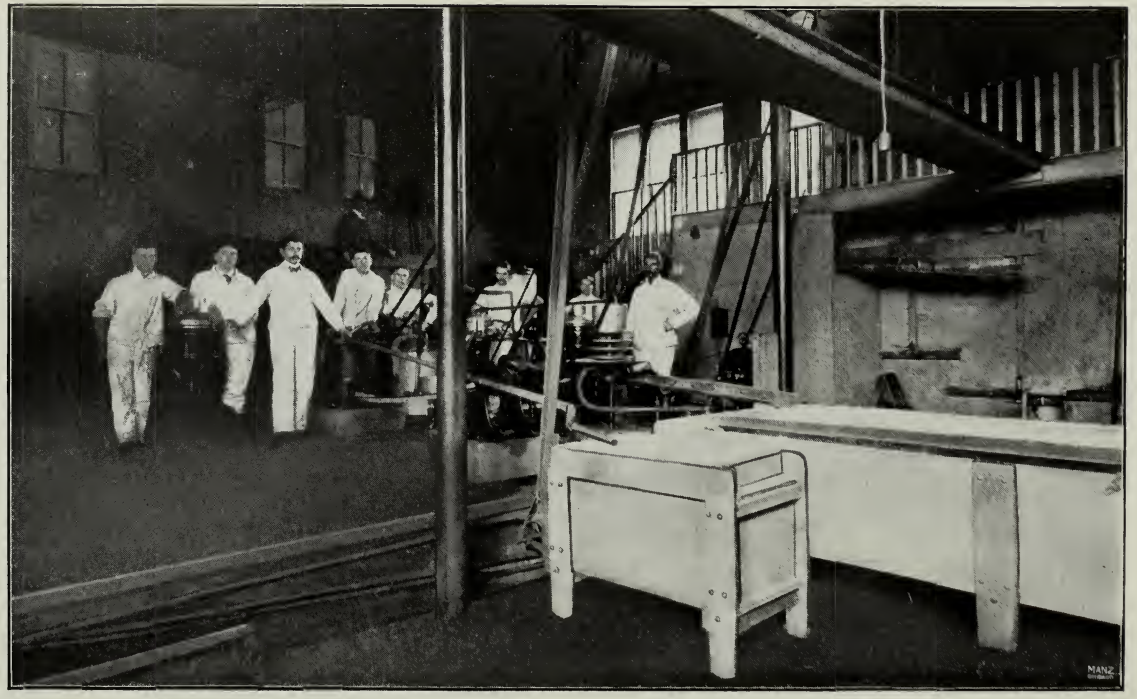
TWO WEEKS COURSE IN DAIRYING.

The prominent rank attained by students of the Iowa Dairy School in state and national contests has led to a demand for special instruction. The short course will begin January 4, 1904, and continue for two weeks; the subjects that will receive special attention during this time are: (Preparation of commercial and natural starters, ripening of cream, judging and scoring of cream and butter and how best to treat the hand separator cream). This latter subject was a special feature of our last year's course. Hand separator cream will be shipped in to the College Creamery during this course and treated in different ways with a view of making the best possible quality of butter from a given quality of cream. (No one but experienced butermakers are advised to take this course. The fees for this course will be $12.00, which is intended to cover expenses involved in securing extra instructors, and material for the course).

The scope of the work given in the Department of Dairying is set forth in the following statements:

Course I.—*Dairy Practice.*—This includes from five to seven hours of practical work in the creamery room during the first term of the One Year Course. This includes buttermaking with Mr. Sheldon and laboratory work in milk testing with Mr. Larson.

"No more guess work in the dairy"—JOHN TUCKER.



Cheese Room.

"It is not well for a man to pray cream and live skim milk."—BEECHER.

In the second term of the Year Course it includes cheesemaking with Professor McKay and Pasteurization with Mr. Bouska. First Term. One year course.

COURSE II.—*Milk and Its Products.*—This includes instruction in the composition of milk and dairy products, the theory of centrifugal separation and the construction of the various kinds of separators. Special attention is given to the effect of varying conditions of the milk on separation. It includes a consideration of the principles of cream ripening, churning and the preparation of butter for the market. Mr. Bouska. First year. First Term. One hour study.

COURSE III.—*Milk Testing.*—This includes a thorough study of the Babcock Test for dairy products with special instructions for overcoming the difficulties from varying conditions. The tests for determining acidity of cream and milk, and the use of the lactometer for detecting adulterations are included, also composite sampling and testing of individual cows. Mr. Larson. First Term. One year course. One hour study.

COURSE IV.—*Dairy Machinery.*—(Mechanical Engineering XL.) This embraces instruction for firing boilers by the most economical methods, the construction and operation of engines and pumps, and the placing of machinery and shafting. Mr. Lennox of the Department of Mechanical Engineering. First Term. One year course. One hour study.

COURSE V.—*Book-Keeping.*—This course is designed to give the students the best form of book-keeping for the business of the factory. Mr. ————————. First Term. One year course. Twenty lectures.

COURSE VI.—*Bacteriology of Milk.*—This course consists of lectures on the nature of bacteria, distribution and the conditions necessary for their growth. The effects produced by various bacteria commonly found in milk are shown by lectures and demonstrations. The methods of handling which cause contamination of milk are considered in detail. That the quality of dairy products depends mostly upon the fermentations which have taken place in these preparations is shown with detailed attention to the use and value of starters in buttermaking and cheesemaking. The principles of cream ripening and pasteurization are also included. Mr. Bouska. First Term. One year course. Two hours study.

COURSE VII.—*Breeding and Judging Dairy Stock.*—In this course the judging of dairy stock with the score card and by

comparison is made a leading feature, while the lectures relate mostly to the principles, methods and practice of breeding dairy stock and their management. Professor W. J. Kennedy and Professor Rutherford. First Term. One year course. One hour study.

COURSE VIII.—*Cheesemaking.*—In the winter term this consists of ten lectures on Chedder cheese, including a study of the kinds of cheese demanded by different markets. In the Second Term of the One Year Course, the same work is taken up as in the winter term, but with the addition of six lectures on fancy brands of cheese, including Limburger, Brick, Swiss, Roquefort, Sage, Stilton, Pine, Apple, and Gouda, etc. Professor McKay. Second Term. One year course.

COURSE IX.—*Scoring Butter and Cheese.*—These lectures are designed to give the student a correct idea of the standard market requirements for dairy products. Butter and cheese are examined and scored by the students and their judgment compared with that of the instructor. Professor G. L. McKay. Second Term. One year course. One hour study.

COURSE X.—*Feeding Dairy Stock.*—Second Term, One Year Course in Dairying. Special attention is given in this course to the principles of feeding animals for the most economical production with a study of the composition and use of various feeding materials, and the feeding of dairy cows, including the influence of various feeding stuffs on the quantity, quality and composition of milk, butter and cheese. Professor Rutherford. Twenty lectures. One hour study.

COURSE XI.—*Dairy Chemistry.*—(Chemistry XXVIII.) The chemical composition of dairy products is considered in a general manner. The alkali test both in theory and practice is given in order that it may be used by the student. The adulteration of butter, cheese and milk as it relates to the dairy industry is also taken up in the lectures. As a whole, the work is intended to furnish a foundation for the student which he can use as a basis for future study. Prof. ————————. Second Term. One year course.

COURSE XII.—*Farm Dairying.*—This is a required study for all four year agricultural students, first term Sophomore year; optional study in course for women. Two recitations per week, and five laboratory demonstrations. The class work takes up composition and secretion of milk, separation of cream by gravity, and centrifugal separators; the Babcock test for determina-

tion of fat, ripening of cream and churning and packing of butter. The latter part of the term will be given to lectures on the bacteriology of milk with reference to the general applications of the subject, such as contamination of milk, relation of bacterial changes to butter and cheese; milk relation of bacterial changes to butter and cheese, etc. As this course has been planned to give the students a knowledge of dairying in general, only five laboratory periods will be involved. The working of the Babcock test for determination of fat, detecting adulteration in milk, testing for acidity in cream, and buttermaking as is practiced in the best modern dairies will be taken up and demonstrated in the laboratory work. Mr. Larson, Mr. Bouska. Second year. First Term. Two hours study.

Course XIII.—*Milk Testing.*—This includes a thorough study of the Babcock test for dairy products with special instructions for overcoming the difficulties resulting from varying conditions. The tests (Mann & Farrington's) for determining acidity of cream and milk and the use of the lactometer for detecting adulterations are included, also composite sampling and testing of individual cows, and the influence of different preservatives upon the milk. Mr. Larson. Second year. Second Semester. Three hours study.

Course XIV.—*Buttermaking.*—This course comprises a detailed and thorough study of the different methods of procedure involved in the manufacture of butter, with the various designs of dairy utensils. Two recitations and one laboratory per week. The class work takes up the secretion and composition of milk, principles of separation of cream by gravity and centrifugal separators; effects of different degrees of acidity of cream upon the quality of butter, and the principles of churning, packing and marketing butter. The laboratory periods are devoted to practical work in the creamery laboratory. The effects of varying conditions upon the quality of butter; how to operate the leading types of separators and churns, and how to prepare tubs and butter so as to procure the best keeping qualities of it, are subjects which will receive special attention in the laboratory. Professor McKay. Third year. First Term. Three hours study.

Course XV.—*Cheesemaking.*—This course involves two recitations and one laboratory period per week. The class work takes up the importance of the quality and composition of milk, as it relates to the manufacture of different kinds of cheese (Cheddar

cheese, Limburger, Brick, Swiss, Roquefort, Sage, Stilton, Pine Apple and Gouda) and principles involved in the cutting, heating, milling, salting and pressing the curd. The influence of organized and unorganized ferments in the making and curing of cheese. The ventilation and construction of cheese curing rooms are also taken up. The laboratory work includes the making of these different kinds of cheese mentioned above. Professor McKay. Third year. Second Term. Three hours study.

COURSE XVI.—*Technology of Milk.*—This course is intended to give to the students a general knowledge of the different ways in which milk and its products are utilized, outside of the scope ordinarily considered under dairying. Such subjects as preparation of condensed milk, certified, modified and hygienic milk. It also includes a study of the preparation and utilization of milk sugar and casein. Mr. Larson. Third year. Second term. One hour study.

COURSE XVII.—*Dairy Bacteriology.*—This course consists of two lectures and one laboratory period per week. It includes a study of the distribution and conditions necessary for the growth of bacteria. The effects produced by the various bacteria commonly found in milk, and that the quality of dairy products depends mostly upon the fermentations, which have taken place in these preparations, is shown with detailed attention to the use and value of starters in butter and cheesemaking. The laboratory work consists of making quantitative and qualitative bacterial analysis of dairy products. Isolating and innoculating different species of bacteria into sterile milk and cream, and noticing the results. Mr. Bouska. Fourth year. First Term. Three hours study.

COURSE XVIII.—*Scoring Butter and Cheese.*—These lectures are designed to give the students a correct idea of the standard market requirements for dairy products. Butter and cheese are examined and scored by the students and their judgments compared with that of the instructor. Professor G. L. McKay. Fourth year. First Term. One hour study.

COURSE XIX.—*Research Work.*—This course has been planned for the advanced students in dairying. It consists in looking up on recent work done in different dairy subjects by the different Experiment Stations; also to read and study the different books on dairying written by the different authors on assigned

In Line for the International.

St. Hubert, Garcia, Shamrock, Prince of Quality, Teddy, Full Back 2d, Silver Crown, and other International Prize Winners

topics. Prof. G. L. McKay. Fourth year. First Term. Two hours study.

COURSE XX.—*Factory Management.*—This course, together with the knowledge the student already has, is intended to qualify a student to superintend or manage any large factory or dairy establishment. The course consists of one lecture per week, and work in the creamery equivalent to two laboratory periods per week. The class work will include such subjects as the economy in the construction of creameries, drainage and ventilation of factories, how to treat the skim milk and other by-products in order to get the best economic results. It is advisable for the student to put in the laboratory work during vacation or some other time when the work can be done during consecutive days. Fourth year. Second Term. Three hours study.

COURSE XXI.—*Preparation of Ice Cream and Ices.*—This course consists of lectures and laboratory work both. They are combined in such a way as to give the student the best understanding possible concerning the preparation of ice cream, sherbets and ices, as made on a private and commercial scale. Fourth year. Second Term. One hour study.

COURSE XXII.—*Thesis.*— The work on thesis must be original work on some dairy subject. The students should consult the professor in charge concerning their subject before or after the beginning of the senior year. The bacterial and chemical laboratory facilities in connection with the creamery plant offer special inducements to the students for doing original work. Frequently arrangements can be made with this department for co-operation in working out important subjects and if the work is deemed meritorious, will be published in bulletin form. The thesis work must represent time equivalent to a two hours' study during the second term of the senior year. Prof. G. L. McKay.

GRADUATE COURSES IN DAIRYING.

This department is especially equipped to offer graduate work to advanced students in dairying. In connection with the creamery, which is in operation the whole year around, there is in the same building a well equipped laboratory in dairy chemistry as well as in dairy bacteriology. This offers special inducements for original work to students in dairying along the following lines:

(a)—*Dairy Bacteriology.*—In this course the student can either pursue work which is valuable chiefly from a scientific

standpoint, or he can take up the work as it relates to some practical subject in the creamery industry. Subjects, as the effect of certain species of bacteria in milk, cream and washwater, upon the quality of butter; the effect of overripe and unripe cream and starters upon the bacterial flora of the same; and the kind of bacteria that causes butter to go "off" in flavor; are of peculiar interest for investigation to dairymen. Special facilities for this kind of work are offered.

(b)—*Dairy Research.*—The research laboratory in the creamery building has recently been equipped with a view of doing special work along the line of dairy chemistry. Investigations on subjects, as the determination of total overrun; the effects of the various amounts of curds, moisture, fat and salt upon the quality and keeping quality of butter; the conditions governing the incorporation of these components of butter and the variation in the composition of milk, butter and butter fat, during the different seasons of the year, are made special features of this course.

(c)—*Factory Management.*—This study embodies the conditions which are to be considered in order to obtain the greatest possible degree of economy in the operation of a large dairy farm or some large factory. How to obtain the best quality as well as the greatest quantity of the special product manufactured; and how to avoid the many leaks so incidental to creamery management are problems that are taken up in this course in a thorough, practical and systematic way.

(d)—*Cheese Making.*—In this course we offer advanced work in the manufacture of Cheddar cheese as well as in the manufacture of the different kinds of fancy cheese. The chemical as well as the bacterial laboratory are open for research work to students pursuing work in this course. The college creamery building has rooms and special facilities for the different steps in the manufacture and curing of cheese.

(e)—*Milk Production.*—Under this heading such subjects as the greatest economic production of milk, with special reference to the individuality of cows; the effects of certain feeds upon the quality of butter and cheese; and the environmental conditions affecting the quantity and quality, are included. This work is facilitated by reason of having in connection a large herd of cows. By the co-operation of the dairy and animal husbandry departments, this work can be pursued in a most practical way.

"Trade increases wealth and glory of a nation but its real strength and stamina are to be looked for among the cultivators of the land."—CHOLTHAN.

COURSE IN DAIRYING.

ACADEMIC YEAR.

FIRST TERM.

Algebra, 5	(Mathematics, I.)
English, 5	(English, I.)
History, 5	(History, I.)
Elocution, 2	(Elocution, I.)

SECOND TERM.

Geometry, 5	(Mathematics, V.)
Elementary Botany, 2	(Botany, I.)
Elementary Rhetoric, 5	(English II.)
History, 4	(History, II.)
Elocution, 1	(Elocution, II.)

FRESHMAN YEAR.

FIRST TERM.

Live Stock and Score Card Practice, 2	(Animal Husbandry, I.)
Market and Home Gardening, 2	(Horticulture, IH.)
German, 5, *or*	(Language, V.)
French, 5	(Language, I.)
~~Farm Mechanics,~~ 5	(Agronomy, I.)
History, Formative Period, 1	(History, XVII.)
Advanced Rhetoric, 5	(English, III.)
Military, 2	(Military, I.)
Library work, 4 hours.	

SECOND TERM.

Live Stock and Score Card Practice, 2	(Animal Husbandry, II.)
Plant Propagation and Small Fruits, 3	(Horticulture, IIH.)
Solid Geometry and Trigonometry, 4	(Mathematics, XVII.)
German, 5, *or*	(Languages, VI.)
French, 5	(Language, II.)
~~Corn and Grain Judging,~~ 5	(Agronomy, ~~II.~~)
Entomology, 2	(Zoology, I.)
Military, 2	(Military, II.)

SOPHOMORE YEAR.

FIRST TERM.

Live Stock and Score Card Practice, 4	(Animal Husbandry, III.)
Pomology, 3	(Horticulture, IIIH.)

Chemistry, 5	(Agricultural Chemistry, XXI.)
Farm Dairying, 2	(Dairying, XII.)
Farm Mechanics, 5	(Agronomy, III.)
Botany, Ecology, 2	(Botany, II.)
Composition, 1	(English, V.)
Military, 2	(Military, III.)

SECOND TERM.

Live Stock and Score Card Practice, 4	(Animal Husbandry, IV.)
Chemistry, 5	(Agricultural Chemistry, XXIII.)
Farm Crops, 5	(Agronomy, IV.)
Bacteriology, 2	(Botany, VII.)
Milk Testing, 3	(Dairying, XIII.)
Composition, 2	(English IV and VI.)
Military, 2	(Military, IV.)

JUNIOR YEAR.

FIRST TERM.

Butter Making, 3	(Dairying, XIV.)
Dairy Engineering, 2	(Engineering, .)
Principles of Breeding, 2	(Animal Husbandry, VIII.)
Chemistry, 4	(Agricultural Chemistry, XXV.)
Soils, 5	(Agronomy, V.)

Elective.

Histology, 2	(Veterinary Science, XXXIII.)
Comparative Physiology, 1	(Veterinary Science, XXI.)
Physiography, 3	(Geology, I.)
Shop Work, 1	(Mechanical Engineering, XXXVIII.)
Analytical Geometry, 5	(Mathematics, VIII.)
Surveying, 4	(Civil Engineering, VIII.)
Photography, 2	(Physics, IX.)
Physical Laboratory, 1 *or* 2	(Physics, XIV.)
Advanced Cryptogamic Botany, 3	(Botany, VI.)
Economic Botany, 2	(Botany, X.)
Economic Entomology, 5	(Zoology, IV.)
Geology, 5	(Geology, II.)
Political Economy, 5	(Economic Science, I.)
English Literature, 3	(Literature, I.)

"Straight mine eye hath caught new pleasures,
Whilst the landscape round it measures;
Russet lawns and fallows gray,
Where the nibbling flocks do stray." MILTON.

The Shepherd and Shropshire Flock

"In the country the days have broad spaces, and the very stillness seems to give a delightful roominess to the hours."
—GEORGE ELIOT.

Debating, 1	(English, VII.)
Elocution 2	(Elocution, III.)
Latin, 5, *or*	(Latin, I.)
German, 5	(Languages, V.)
History, Mediaeval Institutions, 3	(History, V.)
History, The French Revolution, 2	(History, X.)
Military Science, 1	(Military, VI.)

SECOND TERM.

Cheese Making, 3	(Dairying, XV.)
Technology of Milk, 1	(Dairying, XVI.)
Live Stock Management, 2	(Animal Husbandry, V.)
Soils, 5	(Agronomy, VI.)
Chemistry, 4	(Agricultural Chemistry, XXVI.)

Elective.

Comparative Physiology, 1	(Veterinary, XXI.)
Public Speaking, 1	(Elocution, VIII.)
Roads and Pavements, 2	(Civil Engineering, XIII.)
Advanced Analytical Geometry, 3	(Mathematics, XI.)
Vegetable Cytology, 3 *or* 5	(Botany, XII.)
Systematic Botany, 3 *or* 5	(Botany, XV.)
Histology, 4	(Botany, III.)
Mineralogy, 4	(Geology, VI.)
Finance, 3	(Economic Science, V.)
Money and Banking, 2	(Economic Science, IV.)
English Literature, 5	(Literature, II.)
Elocution, 2	(Elocution, IV.)
French, 5, *or*	(Languages, II.)
German, 5	(Languages, VI.)
Debating, 1	(English, VIII.)
History, Europe in the 16th, 17th and 18th Centuries, 3	(History, VI.)
History, Europe since 1850, 2	(History, XI.)
Military Science, 1	(Military, VI.)

SENIOR YEAR.

FIRST TERM.

Dairy Bacteriology, 3	(Dairying, XVII.)
Research Work, 2	(Dairying, XVIII.)
Research Work, 2	(Dairying, XIX.)
Farm Management, 5	(Agronomy, VII.)

Elective.

Comparative Physiology, 2	(Veterinary Science, XXIII.)
Advanced Entomology, 3 *to* 5	(Zoology, IX.)
Agrostology, 2	(Botany, XIII.)
Evolution of Plants, 1	(Botany, XIX.)
Geology, 5	(Geology, II.)
Political Economy, 3	(Economic Science, III.)
History of Political Economy, 2	(Economic Science, II.)
Psychology, 5	(Philosophy, I.)
Fiction, 3	(Literature, III.)
Elocution, 2	(Elocution, V.)
Oration, 1	(Elocution IX.)
French, 4, *or*	(Languages, III.)
German, 4	(Languages, VII.)
History, Development of the United States, 3	(History, III.)
History, Reconstruction and the Constitution, 2	(History, XII.)
Military Science, 1	(Military, VII.)

SECOND TERM.

Factory Management, 3	(Dairying, XIX.)
Preparation of Ice Cream and Ices, 1	(Dairying, XX.)
Animal Nutrition, 5	(Animal Husbandry, IX.)
Sanitary Science, 2	(Veterinary Science, XLV.)
Thesis, 2	(Dairying, XXI.)

Elective.

Comparative Physiology, 2	(Veterinary Science, XXIV.)
Dairying, 3	(Dairying, I.)
Advanced Entomology, 3 *or* 5	(Zoology, IX.)
Calculus, 5	(Mathematics, IX.)
Advanced Bacteriology, 3	(Botany, VIII.)
Geology, 5	(Geology, IV.)
Ethics, 3	(Philosophy, II.)
American Literature, 3	(Literature, IV.)
Elocution, 2	(Elocution, VI.)
History of Civilization, 3	(History, IV.)
The Far Eastern Question, 2	(History, IX.)
Astronomy, 5	(Physics, VIII.)
Chemistry, 5	(Agricultural Chemistry, XXVII.)
Military Science, 1	(Military, VIII.)

"The thoroughbred animal is a good home missionary; it teaches a better way."—ANONYMOUS.

Class in Stock Judging.

"Let the farmer for evermore be honored in his calling, for they who labor in the earth are the chosen people of God."

DEPARTMENT OF ANIMAL HUSBANDRY

WILLARD J. KENNEDY, PROFESSOR.
W. J. RUTHERFORD, ASSISTANT PROFESSOR
WAYNE DINSMORE, INSTRUCTOR
N. C. REW, GRADUATE ASSISTANT.

The department of Animal Husbandry stands for all lines of work which pertain to the judging, selecting, breeding, feeding, development, and care and management of the various breeds and classes of domesticated animals. Recognizing the importance of the live stock industry to the welfare of the state and, on account of the unusual quest from students for instruction along this line, nothing within our power has been left undone to make the equipment for instruction purposes complete in every detail.

The herds and flocks were very carefully established at an early date. From time to time valuable additions in keeping with modern ideas have been made until, at the present time, almost every recognized market class of animal and good representatives of all the recognized breeds are available for student use. An equipment of this kind places us in a position to do work along animal husbandry lines which cannot be accomplished in those institutions where proper specimens of stock are not obtainable. We are firmly convinced that there is but one way to make a young man a proficient judge of live stock, and that is by training his eye. In all of the lecture and laboratory work outlined in our courses the work is demonstrated by the use of living specimens.

The offices and lecture rooms of the department are located on the first floor of Agricultural Hall. The museum, which contains a complete assortment of the various kinds of wools, woolen materials, animal by-products. etc., is located on the third floor of the same building.

The judging pavilions are located near the barns. In this respect we are most fortunate in having two excellent commodious judging pavilions. This allows us to divide our classes, which have in the past been unusually large, into many sections, thus affording an excellent opportunity for individual work. These buildings are well lighted and heated, and are arranged in every way for convenience and comfort on the part of those who take the work.

An excellent collection of horses representing all the market classes and breeds of both light and heavy types is maintained for

instruction work. Among these are good representatives of the Shires, Percherons, Clydesdales, French coachers, Hackneys, Standard breds, and the American Saddle horse. Some of the horses are imported while the others have been selected with much care from the best breeders on the continent.

Over two hundred head of cattle, representing all the leading beef, dual purpose, and dairy breeds are maintained on the farm. Complete breeding herds of most of the breeds are kept. A large herd of Galloway cows are kept for cross breeding purposes used in the production of blue greys. An excellent collection of steers, representing the very highest type of a fat steer, and all the other grades and classes to be found on our leading markets down to the very lowest grades, are always available for class work. This affords our students an excellent opportunity to study the market demands and to know what constitutes each class, also why there is such a wide margin in the prices paid for cattle by the packing house man.

The equipment of the sheep department is especially strong, constituting over two hundred head, containing good representatives of the mutton and wool types and typical specimens of all the leading breeds. Eight distinct breeds, which have been carefully selected to represent the type and characteristics of each breed both in regard to their mutton form and wool bearing qualities, are always available for class room work. In addition to the breeding flocks we always have a choice collection of fat wethers which afford an excellent opportunity for the student to familiarize himself with the highest type of a finished mutton sheep.

In the swine department, representatives of six breeds are maintained, including the best American as well as the leading British varieties. As in the other departments, the aim in this has been to keep in touch with the modern ideas of the leading breeders, both in regard to breeding and type of the animals in these breeds. At all seasons of the year there is more or less feeding of market stock being done on the farm and in connection with the Experiment Station, so that excellent material is always available for instruction purposes regarding the qualities that add to the value of stock for the ordinary market. Having pure bred representatives in addition, it is easy to inform the student in a practical way on the finer points of color, type, and other characteristics that relate to the pure bred classes of stock.

"The first requisite is to be a good animal."—HERBERT SPENCER.

Shamrock.

Grand Champion Steer at the International Live Stock Exposition. 1902. Winner of over $500 in prizes and sold for 56 cents a pound, $1008.46. Owned and exhibited by the Iowa State College.

To further assist in this work, the herd books of the different American and foreign registry associations are being constantly added to the library. Through these the student is not only enabled to inform himself in regard to pedigrees, but he is also enabled through them to study the different scales of points which the breeders have adopted as representing the highest type of the breeds. Other features of the equipment include photographs and charts utilized in the lecture room where it is not possible to make suitable representation with the living animals. It is the aim of the department to illustrate all lines of instruction with living representatives. The abundant material available from the herds and flocks is freely drawn upon and used extensively in all lectures and score card practice. By means of score cards, prepared by the department, the students are brought in close contact with the animals and through them are informed on the points of market merit desirable in ordinary stock; while later the use of the official scale of points for the different breeds in a similar way, makes them skillful in judging representatives of the different breeds.

As soon as the student is familiar with the use of the score card, comparison judging is introduced. In comparison judging from four to six animals are used, and each student is required to place all the animals in order of merit, and write down clearly and concisely on a blank folder, prepared especially for this work, full reasons for making his awards. This kind of work teaches the student to compare animals and to balance the weak and strong points of each in making his final awards. As soon as the student demonstrates his ability to place classes well, herd groups and sweepstake classes are introduced during his Senior year's work. This kind of work is in accordance with the most difficult judging done at our leading state fairs and international expositions. As soon as the student shows that he possesses the qualifications needed to successfully judge stock in the show ring, he is sent out in answer to the many requests from the secretaries to judge various classes of stock at county fairs. This, in connection with his college work, results in crystallizing the lessons learned in the class room.

The following courses of study are given in Animal Husbandry:

Course I.—*Market Types—Cattle and Sheep*—First Term. Freshman Year. This course covers the judging of the different market classes of cattle (beef and dairy) and sheep (mutton

and wool). Judging two 2-hour periods per week. Professor Rutherford and Mr. Dinsmore.

COURSE II.—*Market Types—Horses and Swine*—Second Term. Freshman Year. This course covers the judging of the different market classes of horses (light and heavy), and swine (bacon and fat). Judging two 2-hour periods per week. Professor Rutherford and Mr. Dinsmore.

COURSE III.—*Breed Types—Cattle and Sheep*—First Term. Sophomore Year. This course covers the judging of representatives of the different breeds according to their official standards; also a study of their origin, history, characteristics, and adaptability to different conditions of climate and soil. Lectures two 1-hour periods per week. Judging two 2-hour periods per week. Professor Rutherford and Mr. Dinsmore.

COURSE IV.—*Breed Types—Horses and Swine.*—Second Term. Sophomore Year. This course covers the judging of representatives of the different breeds according to their official standards; also a study of their origin, history and characteristics, and adaptability to different conditions of climate and soil. Lectures two 1-hour periods per week. Judging two 2-hour periods per week. Professor Rutherford and Mr. Dinsmoe.

COURSE V.—*Live Stock Management*—The housing, feeding care and management of the various classes of live stock. Lectues two 1-hour periods per week. Professor Rutherford.

COURSE VI.—*Advanced Stock Judging.*—First Term.. Senior Year. This course covers horses, cattle, sheep, and swine, especial attention being paid to the judging of groups of animals similar to county and state fair work. Judging two 2-hour periods per week. This course is intended for students specializing in Animal Husbandry. Professors Kennedy and Rutherford.

COURSE VII.—*Animal By-Products and Herd Book Study.*—Second Term. Senior Year. This course covers a critical study of animal by-products, as designated by the leading packing establishments, first half of term. Second half of term will be devoted to the careful study of pedigrees of the leading families of the various breeds of live stock. Two 1-hour periods per week. Professor Kennedy.

COURSE VIII.—*Principles of Breeding.*—First Term. Junior Year. This course embraces a study of the principles of breeding, including selection, heredity, atavism, variation, fecundity, with the presentation of the methods of breeding, in-and-in breeding, cross breeding, etc., and a historical study of their

WAYNE DINSMORE CHARLES GRAY W. A. LINKLATI

W. J. WILSON THE SPOOR TROPHY O. B. NEWCOMI

IOWA STATE COLLEGE JUDGING TEAM 1903

Students from the Animal Husbandry Department, who won the highest honors, mo in prizes than any opposing team, and successfully defended the claims of the college to t $700.00 Spoor Trophy, in contest with the leading Agricultural Colleges of the United Stat and Canada.

results. In addition, the several features relating to the higher breeding of pure bred stock are made the subject of study and investigation. Two 1-hour periods per week. Professor Curtiss.

COURSE IX.—*Animal Nutrition.*—Second Term. Senior Year. This course includes anatomy and physiology of the digestive system, the purpose of nutrition, theory and practical economy of rations for growth, fattening, milk or maintenance; sanitation of feeds, and hygiene of the farm. Five 1-hour periods per week. Professor Kennedy.

COURSE X.—*Thesis and Investigation Work.*—Senior Year. Upon lines to be arranged with the head of the department according to the nature of the subject. Professor Kennedy.

SPECIAL COURSES.

Students desiring shorter courses of study will be permitted to take up special courses in any line of work offered providing that they comply with the full requirements for admission to short course work as outlined elsewhere in this catalog. They must also have credits for all necessary work preparatory to the taking of such courses as are demanded of the regular four year men.

WINTER COURSE IN STOCK JUDGING.

In response to a widespread demand for special short course instruction in the judging and feeding of animals a two weeks' course has been established during the winter vacation. This course will begin January 4, 1904, and continue for two weeks and will be devoted exclusively to the judging and score card practice with horses, cattle, sheep, and hogs, and lectures on feeding the same.

In this work special attention will be given to the selection of animals best suited for feeding purposes. Good specimens of the highest type of fat steer and ideal representatives of all the various breeds will be used for class work. At the conclusion of the cattle work a slaughter test and block demonstration of the various market types of steers will be conducted under the supervision of John Gosling, Kansas City, Missouri. This course is intended especially for the man on the farm who cannot avail himself of the opportunity to take a complete course.

A special course in corn judging will be given at the same time and the work will be so arranged that all those present may take both lines of work.

To partially cover the expense of securing additional help and stock for demonstration a tuition fee of $2.00 will be charged for admission to this course, but one fee will cover the instruction in both grain and stock judging.

CLAY, ROBINSON & CO. FELLOWSHIP PRIZES.

Clay, Robinson & Co., Live Stock Commission Merchants, Union Stock Yards, Chicago, offer, annually, $1,000.00 in prizes to be awarded to the Agricultural Colleges making the best exhibit of live stock at the International Live Stock Exposition students in the department of Animal Husbandry. These fellowships, amounting to $300.00 per student annually, are granted by the Board of Trustees upon the recommendation of the dean of the Division of Agriculture and the head of the department. A student holding a fellowship may pursue post-graduate work in Animal Husbandry.

GRADUATE COURSES.

We are now in a position to offer post-graduate work along five distinct lines. Students to be eligible to take this work must comply with the College requirements for post-graduate work as stated elsewhere in this catalog.

(a). *Animal Nutrition.* We have excellent facilities for advanced research work along this line on account of the vast amount of work done on the College farm, and on the Cook farm at Odebolt, Iowa, along the lines of horse, cattle, sheep, and swine feeding experiments. We have, annually, over one thousand animals in feeding experiments under our direct supervision. Students desiring special research work along this line may do the same under the direction of the head of the Department.

(b). *Animal Breeding.* A special line of research work has been outlined for students desiring special work pertaining to underlying principles of animal breeding. Special experiments are being conducted on the farm along new and original lines.

(c). *Study of Breeds.* Our large collection of pure bred animals representing almost every recognized breed of live stock on the continent affords us excellent opportunities for special work along these lines. We not only have typical specimens, but, in most instances, we have complete breeding herds, thus an held at Chicago in December of each year. They stipulate that the money won by the various colleges shall be used for the

"Nobody complains of his judgment."—La Rocheoucauld.

A Group of International Prize Winners—Fed and Exhibited by the College.

establishment of fellowship prizes to be awarded to graduate excellent opportunity to study the adaptability of each breed to Iowa conditions.

(d). *Stock Judging.* We have unusual facilities for thorough work along this line. All of the various market types of animals are available, also good representatives of all the pure breeds. Animals are carefully examined on foot and afterwards slaughtered and cut up on the block and the exact percentages of the various cuts and the values of the same are ascertained.

(e). *Practical Management of Stock.* This course will include an exhaustive investigation and study of the methods in vogue on the best managed stock farms and breeding establishments in the United States, Canada, Great Britain, and other countries, and is intended especially for those students who are preparing themselves for managers of stock farms.

POSITIONS OPEN TO MEN TRAINED ALONG ANIMAL HUSBANDRY LINES.

The demand for competent young men thoroughly trained along the lines of practical and scientific animal husbandry work by far exceeds the supply. We are constantly in receipt of inquiries for men combining college training with practical experience and natural ability. There appears to be no limit to the demand at a compensation not exceeded in any other calling. Our course is so arranged that our students have an excellent chance to combine practical and scientific knowledge. A few of the many lines of work open to graduates of this department are: College and Experiment Station work, Agricultural journalism, Managers of stock farms, Salesmen with commission merchants and Buyers for the packing houses at the many stock yard centers, Salesmen of animal feed stuffs manufactured by the packing houses, Glucose companies, Linseed and Cotton seed oil companies, etc., etc. At the present time we have not nearly enough good men to fill the positions open to graduates.

COURSE IN ANIMAL HUSBANDRY.

ACADEMIC YEAR.

FIRST TERM.

Algebra, 5	(Mathematics, I.)
English, 5	(English, I.)

History, 5 (History, I.)
Elocution, 2 (Elocution, I.)

SECOND TERM.

Advanced Algebra and Plane Geometry, 5 (Mathematics, XIII.)
Elementary Botany, 2 (Botany, I.)
Elementary Rhetoric, 5 (English II.)
History, 4 (History, II.)
Elocution, 1 (Elocution, II.)

FRESHMAN YEAR.

FIRST TERM.

Live Stock and Score Card Practice, 2 (Animal Husbandry, I.)
Market and Home Gardening, 2 (Horticulture, IH.)
German, 5, *or* (Language, V.)
French, 5 (Language, I.)
Corn and Grain Judging, 5 (Agronomy, 1.)
History, Formative Period, 1 (History, XVII.)
Advanced Rhetoric, 5 (English, III.)
Military, 2 (Military, I.)
Library work, 4 hours.

SECOND TERM.

Live Stock and Score Card Practice, 2 (Animal Husbandry, II.)
Plant Propagation and Small Fruits, 3 (Horticulture, IIH.)
Solid Geometry and Trigonometry, 4 (Mathematics, XVII.)
German, 5, *or* (Languages, VI.)
French, 5 (Language, II.)
Farm Mechanics, 5 (Agronomy, II.)
Entomology, 2 (Zoology, I.)
Military, 2 (Military, II.)

SOPHOMORE YEAR.

FIRST TERM.

Live Stock and Score Card Practice, 4 (Animal Husbandry, III.)
Pomology, 3 (Horticulture, IIIH.)
Farm Crops, 5 (Agronomy, III.)
Vertebrate Zoology, 4 (Zoology, II.)
Chemistry, 5 (Agricultural Chemistry, XXI.)
Composition, 1 (English, V.)
Botany, Ecology, 2 (Botany, II.)
Military, 2 (Military, III.)

SECOND TERM.

Live Stock and Score Card Practice, 4	(Animal Husbandry, IV.)
Farm Mechanics, 5	(Agronomy, IV.)
Invertebrate Zoology, 4	(Zoology, III.)
Chemistry, 5	(Agricultural Chemistry, XXIII.)
Composition, 2	(English IV and VI.)
Military, 2	(Military, IV.)

JUNIOR YEAR.

FIRST TERM.

Principles of Breeding, 2	(Animal Husbandry, VIII.)
Chemistry, 4	(Agricultural Chemistry, XXV.)
Farm Dairying, 2	(Dairying, I.)
Embryology, 3	(Zoology, V.)
Soils, 5	(Agronomy, V.)

Elective.

Histology, 2	(Veterinary Science, XXXIII.)
Comparative Physiology, 1	(Veterinary Science, XXI.)
Physiography, 3	(Geology, I.)
Shop Work, 1	(Mechanical Engineering, XXXVIII.)
Analytical Geometry, 5	(Mathematics, VIII.)
Surveying, 4	(Civil Engineering, VIII.)
Photography, 2	(Physics, IX.)
Physical Laboratory, 1 *or* 2	(Physics, XIV.)
Cryptogamic Botany, 4	(Botany, IV.)
Advanced Cryptogamic Botany, 3	(Botany, VI.)
Economic Botany, 2	(Botany, X.)
Economic Entomology, 5	(Zoology, IV.)
Geology, 5	(Geology, II.)
Political Economy, 5	(Economic Science, I.)
English Literature, 3	(Literature, I.)
Debating, 1	(English, VII.)
Elocution 2	(Elocution, III.)
French 5, *or*	(Languages, III.)
German, 5	(Languages, V.)
History, Mediaeval Institutions, 3	(History, V.)
History, The French Revolution, 2	(History, X.)
Military Science, 1	(Military, VI.)
Live Stock Management, 2	(Animal Husbandry, V.)
Animal Parasites, 2	(Zoology, VIII.)

SECOND TERM.

Soils, 5 (Agronomy, VI.)
Chemistry, 4 (Agricultural Chemistry, XXVI.)

Elective.

Forestry, 3 (Horticulture, VIH.)
Comparative Physiology, 1 (Veterinary, XXII.)
Bacteriology, 2 (Botany, VII.)
Public Speaking, 1 (Elocution, VIII.)
Roads and Pavements, 2 (Civil Engineering, XIII.)
Advanced Analytical Geometry, 3 (Mathematics, XI.)
Vegetable Cytology, 3 *or* 5 (Botany, XII.)
Systematic Botany, 3 *or* 5 (Botany, XV.)
Histology, 4 (Botany, III.)
Mineralogy, 4 (Geology, VI.)
Finance, 3 (Economic Science, V.)
Money and Banking, 2 (Economic Science, IV.)
English Literature, 5 (Literature, II.)
Elocution, 2 (Elocution, IV.)
French, 5, *or* (Languages, II.)
German, 5 (Languages, VI.)
Debating, 1 (English, VIII.)
History, Europe in the 16th, 17th, and 18th Centuries, 3 (History, VI.)
History, Europe since 1850, 2 (History, XI.)
Military Science, 1 (Military, VI.)

SENIOR YEAR.

FIRST TERM.

Advanced Live Stock and Score Card Practice, 2 (Animal Husbandry, VI.)
Anatomy of Domestic Animals, 2 (Veterinary Science, LV.)
Obstetrics, 1 (Veterinary Science, XIX.)
Sanitary Science, 2, (Veterinary Science, XLIV.)
Farm Management, 5 (Agronomy, VII.)

Elective.

Dairy Bacteriology, 3 (Dairying, XVII.)
Buttermaking, 3 (Dairying, XIV.)
Comparative Physiology, 2 (Veterinary Science, XXIII.)
Vegetable Pathology, 2 *or* 5 (Botany, V.)
Advanced Entomology, 3 *to* 5 (Zoology, IX.)
Agrostology, 2 (Botany, XIII.)

Evolution of Plants, 1 (Botany, XIX.)
Geology, 5 (Geology, II.)
History of Political Economy, 2 (Economic Science, II.)
Political Economy, 3 (Economic Science, III.)
Psychology, 5 (Philosophy, I.)
Fiction, 3 (Literature, III.)
Elocution, 2 (Elocution, V.)
Oration, 1 (Elocution, IX.)
French, 4, *or* (Languages, III.)
German, 4 (Languages, VII.)
History, Development of the United States, 3 (History, III.)
History, Reconstruction and the Constitution, 2 (History, XII.)
Landscape Gardening, 2 (Horticulture, VIIIH.)
Military Science, 1 (Military, VII.)

SECOND TERM.

Animal By-Products and Herd Books, 2 (Animal Husbandry, VII.)
Horse Shoeing, 2 (Veterinary Science, XVI.)
Conformation and Soundness, 2 (Veterinary Science, XVIII.)
Animal Nutrition, 5 (Animal Husbandry, IX.)
Evolution of Animals, 1 (Zoology, VI.)
Thesis, 2 (Animal Husbandry, X.)

Elective.

Dairying, 3 (Dairying, I.)
Cheesemaking, 3 (Dairying, XV.)
Technology of Milk, 1 (Dairying, XVI.)
Evolution of Cultivated Plants, 1 (Horticulture, XII.)
Advanced Entomology, 3 *or* 5 (Zoology, IX.)
Comparative Physiology, 2 (Veterinary Science, XXIV.)
Calculus, 5 (Mathematics, IX.)
Advanced Bacteriology, 3 (Botany, VIII.)
Vegetable Physiology, 2 *or* 5 (Botany, XI.)
Geology, 5 (Geology, IV.)
Ethics, 3 (Philosophy, II.)
American Literature, 3 (Literature, IV.)
Elocution, 2 (Elocution, VI.)
History of Civilization, 3 (History, IV.)
The Far Eastern Question, 2 (History, IX.)
Astronomy, 5 (Physics, VIII.)
Chemistry, 5 (Agricultural Chemistry, XXVII.)
Military Science, 1 (Military, VIII.)

DEPARTMENT OF HORTICULTURE AND FORESTRY.

HOMER C. PRICE, PROFESSOR.

ARTHUR T. ERWIN, ASSISTANT PROFESSOR. EDWARD E. LITTLE, ASSISTANT.

The Department of Horticulture has offices, classroom and library on the second floor of Agricultural Hall, a laboratory building 35x50 feet, two stories high with a nine foot basement, greenhouses, consisting of a curvilinear palm house, 24x33 feet; an even span house 19x33 feet which is connected to the laboratory and used for laboratory purposes, and three propagating houses, 10x33 feet. Additional greenhouses will be built this summer for the department which will make approximately 4,000 square feet under glass.

The main floor of the laboratory is divided into two rooms and will accommodate fifty students. One of the rooms is especially fitted for the study of fruits, and opening from it are two refrigerators for the storing of specimens. The second floor contains photographic and dark rooms for the department, and the horticultural museum, equipped with a full collection of horticultural implements and machinery. The museum also contains a large collection of fruit models and a horticultural herbarium that is accessible to advanced students.

The green houses give every opportunity for the student to become familiar with the management of plants under glass, and the collection of plants has been made with the view of having them of the greatest educational value.

The department has a large library which is kept in the offices in Agricultural Hall and in addition to the complete files of horticultural publications of the country, possesses the private library of Charles Downing, the author of "Fruits and Fruit Trees of America," which contains many rare horticultural works as well as his original notes and manuscript.

The land devoted to Horticultural purposes comprises about forty acres. In this area are orchards of varying ages from fifteen years down to those set within the last two years. The varieties of fruits on trial number more than one thousand, and include the hardiest types of native and foreign kinds. The student is thus afforded unusual facilities for observation and study. Adjacent to the orchards and small fruit plantations are

the nursery grounds where the operations of the nurseryman in the various methods of stratification, budding and grafting are illustrated in a practical manner. A considerable area is devoted each year to the growing of vegetables and variety tests of the leading types are made in connection with the Experiment Station work, thus affording ample opportunity for field study in the methods of culture practiced by the amateur and market gardener.

There is a forest plantation of about ten acres in which are growing a large number of the best varieties of deciduous trees for the northwest. A collection of over one thousand prepared sections of the American woods is used for illustrating the lectures on forestry. The campus and shelter belts surrounding the college give ample opportunity for a study of the comparative value of native and foreign trees when used for windbreak and landscape effect.

The graduate who completes the course in Horticulture will find himself well equipped in the technique and applied principles of commercial horticulture. Fruit growing has become a specialized industry and success rewards the laborer in proportion as intelligent skill and perseverance are applied to the work, with a thorough understanding of the principles. Graduates who desire to pursue post-graduate work will find themselves well prepared to do so either at this or other institutions of like character.

Text books are used in each course when it is possible to do so advantageously. Lectures are given when it is necessary to enlarge or supplement the text. Particular stress is laid on laboratory instruction and the facilities and equipment are exceptionally good for this phase of the work. The following courses of study are offered:

OUTLINE OF COURSES IN HORTICULTURE.

Course IH.—*Market and Home Gardening.*—This course is a study of the small fruits and vegetables. It takes up the principles of culture, methods of harvesting and marketing, and the practical details of market and home gardening. Two recitations per week. First Term, Freshman. Professor Erwin.

Course IIH.—*Plant Propagation.*—The course embraces a study of the principles of plant growth as affected by moisture, temperature, light and food supply. Propagation of plants by seedage, cuttage, layerage and graftage is studied. Laboratory work is

given in the various methods of propagation, both in greenhouse and nursery. Two recitations and one laboratory period per week. Second Term, Freshman. Professor Erwin.

COURSE IIIH.—*Pomology.*—Under this head the principles which underly successful orcharding in the northwest, and the history and characteristics of the leading varieties of orchard fruits are studied. Score card practice is given, describing apples, plums, pears and grapes. Two recitations and one laboratory period per week. First Term, Sophomore. Professor Price and Mr. Little.

COURSE IVH.—*Plant Breeding and Field Work.*—The principles and history of plant breeding and its special application to horticulture are studied. The commercial nursery stocks, theory and practice in pruning, and a study of spraying machinery are included in this course. Two recitations and one laboratory each week. Second Term, Sophomore. Professor Price and Mr. Little.

COURSE VH.—*Varieties of Fruit.*—This is an advanced course in Pomology and is devoted to a study of varieties, their origin, history and synonyms. Special attention is given to important commercial types and to describing and judging fruit. One recitation and one laboratory. First Term, Junior. Professor Price and Mr. Little.

COURSE VIH.—*Forestry.*—The course embraces a study of forestry influences upon climate, rainfall and erosion. A systematic study is made of the native and introduced forest trees of economic importance. Three hours per week. Second Term, Junior. Professor Erwin.

COURSE VIIH.—*Greenhouse Management.*—This course includes a study of greenhouse construction and heating, a systematic study of the more important greenhouse plants and methods of culture; also the forcing of vegetables in both greenhouses and hot beds. Laboratory work embraces the practical details of propagating and caring for plants in the greenhouses. Two recitations and two laboratories per week. Second Term, Junior. Professor Erwin.

COURSE VIIIH.—*Landscape Gardening.*—The course embraces a study of the principles of landscape gardening, and a systematic study of the materials suitable for planting in Iowa for beautifying private and public grounds. Two hours. First Term, Senior. Professor Price.

"Who loves a garden, loves a greenhouse too."—COWPER.

Horticultural Laboratory and Greenhouse.

* * * "The wind of May
Is sweet with the breath of orchards, in whose boughs
The bees and every insect of the air

COURSE IXH.—*Research.*—This course offers an opportunity for students to carry on a special line of investigation which is mapped out and carried on independently by the student under the supervision of the head of the department. Two hours. First Term, Senior. Professor Price.

COURSE XH.—*Literature of Horticulture.*—The course is designed to familiarize the students with ancient and modern writers on horticulture. Special attention is given to the writings of American authors and to current literature. Two hours. Second Term, Senior. Professor Price.

COURSE XIH.—*Amateur Floriculture.*— This course embraces a study of the propagation and general management of house plants, out door flower beds and ornamental shrubs. A systematic study of annuals, herbaceous perennials, bulbs, climbers and hot house plants is also included in the course. Two hours per week. First Term, Junior. The course is an elective in General and Domestic Science Course only. Professor Erwin.

COURSE XIIH.—*Evolution of Cultivated Plants.*—The course is a study of the origin and amelioration of the important horticultural plants, including fruits, flowers and vegetables. Two hours. Second Term, Senior. Professor Price.

COURSE XIIIH.—*Thesis.*—A subject shall be chosen under the direction of the head of the department, which shall require original work to investigate. After the subject has been thoroughly investigated a complete write up of the results must be made. All required courses in horticulture except those given in second term senior are prerequisites of this course. A subject for investigation may be chosen for Course IX. and the work continued in Course XIII. Two hours credit for the second term, Senior year, will be given for this course. Professor Price.

GRADUATE WORK.

The department of horticulture offers graduate work along four distinct lines:

Pomology.—The orchards of the department, which contain over two hundred and fifty varieties of apples, one hundred and fifty varieties of plums, and fifty varieties of cherries, furnish abundant material for the specialist who desires to make a comparative study of varieties. In addition to this, the department possesses the private library of Charles Downing and his unpublished manuscript notes and descriptions; also several hun-

dred catalogued descriptions of fruit that have been made in the last few years in the department.

Plant Breeding.—For many years systematic plant breeding has been carried on by the department. The results of this work can be seen in all stages from the young plants just starting to grow to those that have been fruiting or flowering for many years. The department each year carries on extensive work in plant breeding in connection with the State Horticultural Society which offers exceptional opportunity for study and field experience by the specialist. The department is equipped with incubators, microscopes and other apparatus for laboratory investigations.

Greenhouse Work.—The greenhouses of the department give exceptional opportunity for investigation along this line. The department has five thousand square feet under glass, divided into eight different houses which are devoted to the growing of flowers, vegetables, and plant breeding experiments. Opportunity is offered for investigation in greenhouse management, propagation of plants and a study of the insect and fungus enemies of greenhouse plants.

Forestry.—Iowa, being a treeless state, presents many new and unsolved problems of tree growth, such as adaptation of species to the varying soil and climatic conditions, influence of wind breaks and shelter belts, and the comparative rate of growth of the different species. Upon and adjoining the college grounds are groves of evergreen and deciduous trees of varying ages which provide facilities for investigation along this line. The department has in its museum forestry specimens representing one thousand species. The department is also co-operating with the United States Weather Bureau in the investigation of the influence of windbreaks upon climate.

COURSE IN HORTICULTURE.

ACADEMIC YEAR.

FIRST TERM.

Algebra, 5	(Mathematics, I.)
English, 5	(English, I.)
History, 5	(History, I.)
Elocution, 2	(Elocution, I.)

"Which does mend nature, change it rather; but
The art itself is nature."—SHAKESPEARE.

A Laboratory in Horticulture.

"Nature sleeps in the plant, dreams in the animal, wakes in the man."—SCHELLING.

SECOND TERM.

Advanced Algebra and Plane Geometry, 5	(Mathematics, XIII.)
Elementary Botany, 2	(Botany, I.)
Elementary Rhetoric, 5	(English II.)
History, 4	(History, II.)
Elocution, 1	(Elocution, II.)

FRESHMAN YEAR.

FIRST TERM.

Live Stock and Score Card Practice, 2	(Animal Husbandry, I.)
Market and Home Gardening, 2	(Horticulture, IH.)
German, 5, *or*	(Language, V.)
French, 5	(Language, I.)
Corn and Grain Judging, 5	(Agronomy, I.)
Advanced Rhetoric, 5	(English, III.)
History, Formative Period I	(History, XVII.)
Military, 2	(Military, I.)

Library work, 4 hours.

SECOND TERM.

Live Stock and Score Card Practice, 2	(Animal Husbandry, II.)
Plant Propagation and Small Fruits, 3	(Horticulture, IIH.)
Solid Geometry and Trigonometry, 4	(Mathematics, VI.)
German, 5, *or*	(Languages, VI.)
French, 5	(Language, II.)
Farm Mechanics, 5	(Agronomy, II.)
Entomology, 2	(Zoology, I.)
Military, 2	(Military, II.)

SOPHOMORE YEAR.

FIRST TERM.

Pomology, 3	(Horticulture, IIIH.)
Farm Crops, 5	(Agronomy, III.)
Chemistry, 5	(Agricultural Chemistry, XXI.)
Botany, Ecology, 2	(Botany, II.)
Meteorology, 3	(Geology, I.)
Farm Dairying, 2	(Dairying, XII.)
Composition, 1	(English, V.)
Military, 2	(Military, III.)

SECOND TERM.

Field Work and Plant Breeding, 3	(Horticulture, IVH.)
Histology, 4	(Botany, III.)

Vegetable Cytology, 3 *or* 5, *or*	(Botany, XII.)
Systematic Botany, 3 *or* 5	(Botany, XV.)
Chemistry, 5	(Agricultural Chemistry, XXIII.)
Agricultural Geology, 3	(Geology, IX.)
Composition, 2	(English IV and VI.)
Military, 2	(Military. IV.)

JUNIOR YEAR.

FIRST TERM.

Advanced Pomology, 2	(Horticulture, VH.)
Economic Entomology, 5	(Zoology, IV.)
Cryptogamic Botany, 4	(Botany, IV.)
Soils, 5	(Agronomy, V.)

Elective.

Histology, 2	(Veterinary Science, XXXIII.)
Physiology, 1	(Veterinary Science, XXI.)
Shop Work, 1	(Mechanical Engineering, XXXVIII.)
Analytical Geometry, 5	(Mathematics, VIII.)
Surveying, 4	(Civil Engineering, VIII.)
Photography, 2	(Physics, IX.)
Physical Laboratory, 1 *or* 2	(Physics, XIV.)
Advanced Cryptogamic Botany, 3	(Botany, VI.)
Geology, 5	(Geology, II.)
Political Economy, 5	(Economic Science, I.)
English Literature, 3	(Literature, I.)
Debating, 1	(English, VII.)
Elocution 2	(Elocution, III.)
German, 5, *or*	(Languages, V.)
French, 5	(Languages, I.)
History, Mediaeval Institutions, 3	(History, V.)
History, The French Revolution, 2	(History, X.)
Military Science, 1	(Military, VI.)

SECOND TERM.

Forestry, 3	(Horticulture, VI.)
Bacteriology, 2	(Botany, VII.)
Economic Botany, 2	(Botany, X.)
Greenhouse Management, 4	(Horticulture, VII.)
Soils, 5	(Agronomy, VI.)

"Jock, when ye hae naething else to do, ye may be aye sticking in a tree; it will be growing, Jock, when ye're sleeping."
--WALTER SCOTT.

A Lesson in Budding.

"It will do the professional student good to be educated side by side with those who expect to obtain a living by labor."

Elective.

Physiology, 1 (Veterinary, XXII.)
Public Speaking, 1 (Elocution, VIII.)
Roads and Pavements, 2 (Civil Engineering, XIII.)
Advanced Analytical Geometry, 3 (Mathematics, XI.)
Farm Crops, 5 (Agronomy, IV.)
Systematic Botany, 3 *or* 5 (Botany, XV.)
Histology, 4 (Botany, III.)
Mineralogy, 4 (Geology, VI.)
Finance, 3 (Economic Science, V.)
Money and Banking, 2 (Economic Science, IV.)
English Literature, 5 (Literature, II.)
Elocution, 2 (Elocution, IV.)
French, 5, *or* (Languages, II.)
German, 5 (Languages, VI.)
Debating, 1 (English, VIII.)
History, Europe in the 16th, 17th and 18th Centuries, 3 (History, VI.)
History, Europe since 1850, 2 (History, XI.)
Military Science, 1 (Military, VI.)

SENIOR YEAR.

FIRST TERM.

Landscape Gardening, 2 (Horticulture, VIIIH.)
Research Work, 2 (Horticulture, IXH.)
Advanced Entomology, 3 *to* 5 (Zoology, IX.)
Chemistry, 4 (Agricultural Chemistry, XXV.)
Vegetable Pathology, 2 (Botany, V.)

Elective.

Dairy Bacteriology, 3 (Dairying, XVII.)
Butter Making, 3 (Dairying, XIV.)
Comparative Physiology, 2 (Veterinary Science, XXIII.)
Farm Management, 5 (Agronomy, VII.)
Agrostology, 2 (Botany, XIII.)
Geology, 5 (Geology, II.)
Political Economy, 3 (Economic Science, III.)
History, Political Economy, 2 (Economic Science, II.)
Psychology, 5 (Philosophy, I.)
Fiction, 3 (Literature, III.)
Elocution, 2 (Elocution, V.)

Oration, 1 (Elocution, IX.)
French, 4, *or* (Languages, III.)
German, 4 (Languages, VII.)
History, Development of the United States, 3 (History, III.)
History, Reconstruction and the Constitution, 2 (History, XII.)
Military Science, 1 (Military, VII.)

SECOND TERM.

Literature of Horticulture, 2 (Horticulture, XH.)
Evolution of Cultivated Plants, 2 (Horticulture, XIIH.)
Animal Nutrition, 5 (Animal Husbandry, IX.)
Vegetable Physiology, 2 (Botany, XI.)
Thesis, 2 (Horticulture, XIIIH.)

Elective.

Dairying, 3 (Dairying, I.)
Cheese Making, 3 (Dairying, XV.)
Comparative Physiology, 2 (Veterinary, XXIV.)
Technology of Milk, 1 (Dairying, XVI.)
Advanced Entomology, 3 *to* 5 (Zoology, IX.)
Calculus, 5 (Mathematics, IX.)
Advanced Bacteriology, 3 (Botany, VIII.)
Geology, 5 (Geology, IV.)
Ethics, 3 (Philosophy, II.)
American Literature, 3 (Literature, IV.)
Elocution, 2 (Elocution, VI.)
History of Civilization, 3 (History, IV.)
The Far Eastern Question, 2 (History, IX.)
Astronomy, 5 (Physics, VIII.)
Chemistry, 5 (Agricultural Chemistry, XXVII.)
Military Science, 1 (Military, VIII.)

AGRICULTURAL CHEMISTRY.

A. A. BENNETT, PROFESSOR.
———————— ASSISTANT PROFESSOR.

The aim of the work in Agricultural Chemistry is twofold; namely, to give the student a fundamental knowledge of chemistry, and then to apply this knowledge to the chemical problems of agriculture.

A sufficient amount of time during the first year and a half of study is applied to the acquiring of chemical principles and relations, yet at the same time the application of these facts is considered and constitutes a portion of the work. In other words the study of the science of chemistry accompanies its application to agricultural questions. The later work of the courses is principally devoted to applied chemistry.

The courses of study open to the undergraduate student are briefly described as follows:

COURSE XXI.—*Elementary Experimental Chemistry.*—This is the introductory work for the students in the agricultural courses and is intended to give knowledge of matter by actual handling and experience with it. The recitations are upon the laboratory work for the purpose of obtaining a first-hand knowledge of chemical changes. The student learns how, and the necessity for taking notes of useful data, how to interpret these facts and apply them to common chemical changes that are going on in nature. The course includes a study of the so-called non-metallic elements that are present in the air and soils, etc. There are three recitations and two afternoons of laboratory practice per week. First Term, Sophomore Year.

COURSE XXIII.—This course is a continuation of Course XXI, dealing with the metallic elements and their relation to those studied in the preceeding term. In this course the student becomes acquainted with the basic elements in the soil and their relations to non-metallic compounds, i. e., the acids and their place in the formations of salts. He learns how to separate and recognize these elements, their compounds, preparatory to determining them quantitatively. Three recitations and two afternoons of laboratory work are required each week. Second Term, Sophomore Year.

COURSE XXV.—*Organic Chemistry.*—This course follows regularly Courses XXI and XXIII and deals with substances pro-

duced by animal and plant life. The laboratory study brings the student in touch with the properties and methods of preparing organic food material. The sugars, starches and proteids, the simpler food material will be studied and at the same time the fundamentals of organic chemistry will be required. The work is divided into two recitations and two laboratory periods per week, during the First Term, Junior Year.

COURSE XXVI.—*Chemistry Applied to Agriculture.*—This work will be introduced in the laboratory study by quantitative analysis of inorganic substances followed by analyses of soils, fertilizers and other inorganic substances related to agricultural processes. The recitation work, two hours per week, will follow the laboratory practice and be accompanied by text book and lecture study.

COURSE XXVII.—*Chemistry Applied to Agriculture.*—This course will consider in an elementary manner the organic phase of Agricultural Chemistry and will deal with the chemical changes in foods during digestion and assimilation, and the changes that occur in the plant and animal body. Some time will be devoted to dairy products and especially to the methods of analyzing such substances for adulteration. Laboratory practice will occupy two afternoons per week.

COURSE XXVIII.—*Dairy Chemistry.*—Lectures and laboratory practice. This course is for students in the one year course in dairying, and will be arranged to fit the needs and the preparation of such students, but it will be an elementary character throughout. First Term.

COURSE XXIX.—Continuation of Course XXVIII. Second Term.

GRADUATE WORK IN AGRICULTURAL CHEMISTRY.

Advanced work in agricultural chemistry leading to the master's degree in scientific agriculture may be selected either as a major or minor study. This work may be taken in the chemical department as a continuation of the work begun as an undergraduate of this college or any other college of equal rank. Or the student may elect to do this work with the chemical section of the experiment station thus coming in touch with the research work and investigations being carried on there. The following courses of graduate work are offered:

COURSE I.—*Chemistry of Soils.*—This course embraces a study in soil chemistry and its relation to plant life, including the

chemical composition, its relation to fertility, the determination of available plant food, fertilizers and other substances which are effective in the production of crops, also the study of rain and drainage waters, the loss of plant food due to improper drainage and other conditions.

COURSE II.—*Chemistry of Dairying.*—This work will cover a general survey of the field of chemistry applied to dairy problems such as the composition and chemical changes of butter, milk and cheese, and also other oils and fats used as food products and for adulteration.

COURSE III.—*Chemistry of Feeds.*—This course includes a careful study of the chemistry of plants and field crops, such as the chemical composition of corn, wheat and oats, methods of modifying and improving the chemical composition by selection and plant breeding, chemical study of growing plants during the various stages of development, etc., the effects of various elements in the soil on the composition and quality and the yield or productiveness of the grain and forage crops. The study of the chemical composition and nutriments of the various refuse and by-products used for stock feeding.

COURSE IV.—*Chemistry of Horticulture.*—This course includes a careful study of the chemical composition of fruits including the influence of various elements present in the soil on the composition, quality and productiveness of the orchard, vineyard or garden; also the influence of climatic conditions upon the composition and quality of fruits, and the influence of selection and breeding.

AGRICULTURAL GEOLOGY.

COURSE IX.—Open to students in division of agriculture, Second Term, Sophomore Year, and counts three hours. The origin, mineralogy and physiography of soils with attendant problems are treated as fully as the time will permit. Dr. Beyer.

COMPARATIVE ANATOMY.

Prepared for students in Animal Husbandry (Veterinary Science, 55), and comprises lectures from models and prepared specimens, recitations and practical work in dissection. This course is given during the first term, Senior year. Dr. McNeall.

THE AGRICULTURAL CLUB.

A Students' Agricultural Club holds weekly meetings in Agricultural Hall for the consideration of current topics in agri-

culture. A students' reading room is also maintained there, and all the leading agricultural journals are kept on file for the use of agricultural students. The College Library contains an extensive list of agricultural and scientific publications to which students are referred for original research and study.

There are seven societies that hold their weekly meetings on Saturday evenings and serve to supplement the literary work of the college. All students are urged to join in the work of the Agricultural Club and advised to join one of the literary societies and to avail themselves of these other adjunct means of instruction. The faculty of clear and concise thinking and speaking is of incalculable value to the agricultural student.

REMUNERATIVE AND INSTRUCTIVE LABOR.

The Agricultural courses afford opportunity to do considerable work in the fields and about the barns and grounds, much of which is instructive and of practical educational value. The compensation for services of this kind ranges from 8 to 15 cents per hour, according to the merit of the work. Students are thus able to earn from one-fourth to one-half their expenses and at the same time materially strengthen the practical side of their education. A number of the strongest and most capable students have been aided in finding employment during vacations with successful stockmen on good farms and in various other positions in line with their chosen lines of work. Some young men have preferred to take a year of practical work in this way during their course, and it has invariably proved of marked benefit and enabled them to command more desirable and remunerative positions at the completion of their college work. Too much emphasis cannot be placed on a thorough understanding of the practical application of correct principles in agriculture.

SPECIAL COURSES.

Students desiring shorter courses of study will be permitted to take up special courses in accordance with the general regulations governing such work and subject to the approval of the Dean of the Division of Agriculture and the President of the College.

Such courses may cover a period of one term, one year or two years, but special students are advised to take not less than one year's work in any chosen branch and in all cases where

practicable or possible to do so, students are urged to complete the four years' course. The results will fully justify the time and expense required and modern agriculture demands thorough training, special fitness, and a high order of ability. No degrees are granted for less than four years' work.

GRADUATE COURSES.

Special facilities are offered for Graduate work in the following lines as described under the head of graduate work in the several departments:

1. Agronomy, major or minor in
   - (a) Farm Crops.
   - (b) Farm Mechanics.
   - (c) Soils.
   - (d) Farm Management.
2. Dairying.
   - (a) Dairy Bacteriology.
   - (b) Dairy Research.
   - (c) Factory Management.
   - (d) Cheese Making.
   - (e) Milk Production.
3. Animal Husbandry.
   - (a) Animal Nutrition.
   - (b) Animal Breeding
   - (c) Study of Breeds.
   - (d) Stock Judging.
   - (e) Practical Management of Stock.
4. Horticulture, major or minor in
   - (a) Pomology.
   - (b) Plant Breeding.
   - (c) Greenhouse Work.
   - (d) Forestry.
5. Agricultural Chemistry, major or minor in
   - (a) Organic Agricultural Chemistry.
   - (b) Inorganic Agricultural Chemistry.
   - (c) Sanitary Agricultural Chemistry.
   - (d) Techincal Chemistry.

The four years' course lead to the degrees of B. S. A., Bachelor of Scientific Agriculture. Graduate Students are eligible for the degree of M. S. A., Master of Scientific Agriculture. This

degree is granted only to students who have completed a four year course in this or some similar college and completed a two year graduate course in scientific and practical agriculture, one year of which must be resident work at this college. The work required for a post graduate degree is largely in the nature of personal research and investigation under the direction of professors in charge of the studies chosen. The work selected must embrace a major and a minor subject in different departments.

CREDITS FOR PRACTICAL WORK.

Agricultural students who, by previous agreement with the head of the department, do practical work on farms, horticultural or feeding or breeding establishments, beet sugar factories or forestry reservations, of recognized standing, during their course of study will be allowed credits on the following basis: Students who take practical work of the kind described under the direction of the proprietor and render competent and faithful service, will, on their return to College and the presentation of a concise written report or resume of their observations and experience, be entitled to the following credits in the four year courses in Agriculture:

For three months, five hours of elective work in the Junior or Senior year; for six months, eight hours; and for one year, ten hours; no more than five hours of which shall be credited in any one term of the college course.

POSITIONS.

The demand for competent young men thoroughly trained in practical and scientific agriculture and dairying exceeds the supply. We are in constant receipt of inquiries for men combining college training with practical experience and natural ability. There appears to be no limit to the demand for the right kind of men and the compensation for such service is not exceeded in any other calling. In view of this demand for well trained men in the field of agriculture, students are urged to take a full four years' course, supplemented with extensive practical work and observation. To this end, a number of our best students have taken a term or a year out during their course on some of the best farms of this and other states; and many have secured employment during vacations in large dairy and horticultural establishments where the most valuable practical experience can

be acquired. The importance of this feature of preparation cannot be overestimated and it is urged and recommended even where young men are entirely familiar with ordinary agricultural work. It enables the student to derive more benefit from his course in college and fits him for a better and more lucrative position after graduation.

DEPARTMENT OF AGRICULTURE SCHOLARSHIP.

The State Department of Agriculture offers a scholarship prize of $200.00, open to young men of the state not enrolled as a regular or special student in any agricultural college, without barring students of the special short courses in January. This scholarship is to be awarded for the best work in judging live stock and corn annually at the state fair in accordance with the rules and conditions prescribed by the state department of agriculture governing this contest. This prize has been supplemented by some additional special prizes, making the scholarship worth about $250.00.

EXPERIMENT STATION

"These ample barns, with feed in store,
Are filled to overflowing."—WHITTIER.

Experiment Station Barn.

EXPERIMENT STATION STAFF

E. W. STANTON, M. Sc.,
Acting President.

C. F. CURTISS, B. Sc., M. S. A.,
Director.

W. J. KENNEDY, B S A.,
Animal Husbandry and Vice Director.

J. B. WEEMS, Ph. D.,
Chemist.

L. H. PAMMEL, B. Ag., M. Sc., Ph. D.,
Botanist.

H. E. SUMMERS, B. S.,
Entomologist.

HOMER C. PRICE, M. S. A.,
Horticulturalist.

JOHN J. REPP, V. M. D.,
Veterinarian.

G. L. McKAY,
Dairying.

P. G. HOLDEN, M. Sc., B. Pd.,
Agronomist.

W. H. STEVENSON, A. B.,
Soils.

F. W. BOUSKA, B. S. A.,
Dairy Bacteriologist.

E. C. MYERS, B. S. A.,
Assistant Chemist.

E. E. LITTLE, M. S. A.,
Assistant in Horticulture.

W. J. RUTHERFORD, B. S. A.,
Assistant in Animal Husbandry.

C. LARSON, B. S. A.,
Assistant in Dairying.

W. H. OLIN, M. Sc.,
Assistant in Agronomy.

ALFRED ATKINSON,
Assistant in Agronomy.
JOSEPH E. GUTHRIE, M. A.,
Assistant in Entomology.
G. M. LUMMIS,
Assistant in Botany.
R. E. BUCHANAN,
Assistant in Botany.
CHARLOTTE M. KING,
Artist.

EXPERIMENT STATION.

The investigations of the Experiment Station have an intimate relation to the college work of instruction, as the problems occupying the attention of the Station are those that have a material bearing on the profit of the farm, and they are also those that are timely, and in need of accurate investigation. Whether relating to the field or the feed lot, the aim is to investigate those questions which will have a practical relation to successful agriculture. Originality is made a feature of the work so far as it is consistent with useful results, and in all instances the sole object is to throw light on the truth relating to the various principles and practices of the farm. The field work strongly supports the instruction of the College in regard to the varieties of grains and the method of cultivation, thus enabling the student to become acquainted with the latest ideas relating to these. Thorough tests are made of the different varieties of fodders, grasses and grains. In addition to this, complete trials, embodying various crops and systems of culture, are carried on extensively each year, with the hope of giving direction to the farm management that is best for Iowa.

The investigations with animals embrace a study of the value of different feeds for different features of animal production. The system of feeding, the preparation of different feeds are also made the subjects of investigation as far as it is thought they may be made a part of the methods of the Iowa farmer. Included with these, there have been a large number of trials with the different types of animals suitable for the requirements of the market. The object sought in this department of the Station work has been to indicate the manner in which the Iowa farmer through the employment of animals can realize the most from his

farm products and add to the fertility of the farm. The Experiment Station has reached out in this way to a remarkable degree, bringing sheep from Mexico, Colorado and Scotland, cattle from Texas and Great Britain, horses from Wyoming, Montana and Europe, in its endeavor to thoroughly study this very important feature of the farmer's work. The data from these experiments is always accessible to the student and he has the opportunity of daily observing the development of it at every stage.

The dairy industry is already indebted to the Experiment Station for doing much towards establishing it on a surer foundation of accurate knowledge. The Station has always kept in closest touch with those engaged in the various lines of the dairy industry. Some of the problems which practical men are constantly meeting and asking aid in solving, are at all times objects of experiment by the Dairy Section. The students have the advantage of seeing these experiments carried out, and in some cases assist in the work themselves. In this way they learn not only what are the chief problems to be solved but become informed on the methods employed in different lines of investigation. The experimental work that has been so far conducted, relates mainly to the various problems of buttermaking while lately features of cheesemaking have been made subjects of special study. The records of these are abundantly used in class work, together with the results from the later investigations in the newer field of bacteriology.

The Horticultural Department in its connection with the Experiment Station affords the student admirable opportunities for checking the theory of the class room against the practice of the field. The connection of the Department of Horticulture with the State Horticultural Society is such that problems touching the commercial side of fruit growing receive the closest attention. The field equipment of the Department is excellent, so that experiments in spraying for the prevention of fungous pests and injurious insects may be carried on under the eye of the student; this is true also of other phases of orchard routine, such as fertilizing, pruning and thinning. The experimental nursery work carried on is of decided educational value. In plant breeding, extensive experiments have been inaugurated and are still in progress. The Station work thus equips the student with the practice and technique necessary to a thorough horticultural training.

Scenes from the Experiment Station Investigation, Brookmont Farm, Odebolt, Iowa.

LIST OF AGRICULTURAL STUDENTS, 1902-03.

GRADUATE STUDENTS.

NAME.	TOWN.	COUNTY.
Ellis, C. E., B. S. A.,	Ames,	Story.
Frandson, J. H., B. S. A.,	Story City,	Story.
Myers, E. C., B. S. A.,	Des Moines,	Polk.

SENIORS.

NAME.	TOWN.	COUNTY.
Allison, Frank E.,	Lohrville,	Calhoun.
Angier, G. H.,	Storm Lake,	Buena Vista.
Brown, Paul H.,	Sioux City,	Woodbury.
Christie, G. I.,	Winchester,	*Ontario, Can.*
Howard, E. R. T.,	Ames,	Story.
Hunt, Thos. S.,	Ackley,	Hardin.
Hyde, E. A.,	Washington,	*D. C.*
Jones, John S.,	Manchester,	Delaware.
Linklater, W. A.,	Dunlap,	*Ontario, Can.*
Lummis, G. M.,	Ames,	Story.
Norton, C. W.,	Wilton Junct'n,	Muscatine.
Otto, W. W.,	Castana,	Monona.
Ritzman, E. G.,	Maquoketa,	Jackson,
Royce, Oscar,	Ames,	Story.
Smith, W. W.,	Nevada,	Story.
Van Pelt, H. G.,	Des Moines,	Polk.
Wall, J. C.,	Ankeny,	Polk.
Wilson, Wm. J.,	Earlham,	Madison.

JUNIORS.

NAME.	TOWN.	COUNTY.
Brockman, H A.,	Walcott,	Scott.
Carey, John,	Ames,	Story.
Carter, L. E.,	Charleston.	*South Carolina.*
Crouse, F. H.,	Dike,	Grundy.
Danforth, H. G.,	Little Cedar,	Mitchell,
Dinsmore, Wayne,	Ames,	Story.
Dixon, C. O.,	Stuart,	Guthrie.
Drake, J. A.,	Ames,	Story.
Eiler, D. W.,	Sioux Rapids,	Buena Vista.
Gray, Charles,	Ames,	Story.
Hansen, Fred M.,	Goldfield,	Wright.

Heavenhill, Mark,	Ames,	Story.
Holder, J. A.,	Des Moines,	Polk.
Howard, Harry,	Ames,	Story.
Leffler, G. V.,	Hillsboro,	Henry.
Merritt, M. L.,	Grundy Center,	Grundy.
Miller, A. A.,	Ames,	Story.
Newcom, Oakes B.,	Odebolt,	Sac.
Packer, Marion E.,	Rockwell City,	Calhoun.
Rubel, C. W.,	Ames,	Story.
Shaff, J. O.,	Camanche,	Clinton.
Sheldon, DeLa,	Ames,	Story.
Torres, Gonzalo,	Leon,	*Mexico.*
Tourgee, C. H.,	Ida Grove,	Ida.
Ulibarri, Ricardo,	Leon,	*Mexico.*
Williams, H. R.,	Grandview,	Louisa.

SOPHOMORES.

NAME.	TOWN.	COUNTY.
Armstrong, E. O.,	Marne,	Cass.
Ashby, J. B.,	Creston,	Union.
Baker, Clyde E.,	Britt,	Hancock.
Barclay, Paul V.,	West Liberty,	Muscatine.
Bechtle, C. R.,	Le Mars,	Plymouth.
Belknap, Cole,	Goldfield,	Wright.
Bliss, R. K.,	Diagonal,	Ringgold.
Boardman, Glenn,	Des Moines,	Polk.
Bothell, Frank,	Corning,	Adams.
Bowman, M. L.,	Corning,	Adams.
Campbell, Foster,	Newton,	Jasper.
Cassidy, Robert,	Ames,	Story.
Claybaugh, W. C.,	Greenfield,	Adair.
Confare, Bert,	Nevada,	Story.
Curtis, Robert S.,	Col. Junction,	Louisa.
Cutler, Geo. C.,	Ames,	Story.
Cutler, James L.,	Orchard,	Mitchell.
Cutler, P. D.,	Ames,	Story.
Dickey, John,	Goose Lake,	Clinton.
Ellis, J. A.,	Ames,	Story.
Epley, Arthur C.,	Shell Rock,	Butler.
Farnum, R.,	Spencer,	Clay.
Findley, Chas. D.,	Grimes,	Polk.
Greene, Merritt,	Marshalltown,	Marshall.
Gribben, Ray,	Minburn,	Dallas.
Grubb, Victor,	Panora,	Guthrie.
Guthrie, Edward S.,	Coin,	Page.
Guthrie, J. C.,	Coin,	Page.
Hall, C. W.,	Iowa City,	Johnson.
Handley, Ernest E.,	Carroll,	Carroll.
Heisey, C. J.,	Monticello,	Jones.
Hirons, Frank G.,	Early,	Sac.
Holden, C. L.,	Cherokee,	Cherokee.

Howard, Chelsea,	New Provid'ce,	Hardin.
Hughes, F. J.,	Omaha,	*Nebraska.*
Huston, Ralph,	Sperry,	Des Moines.
Jeffs, Royal,	Ames,	Story.
Knickerbocker, C. J.,	Fairfax,	Linn.
Lynch, Wm. J.,	Green Mountain	Marshall.
Maharg, Earl,	Audubon,	Audubon.
Martin, W. G.,	Crawfordsville,	Washington.
McCulloch, M. E.,	Humeston,	Wayne.
Mills, George D,	Helena,	*Montana.*
Minkler, Fred,	Nevada,	Story.
Mosher, M. L.,	West Liberty,	Muscatine.
Nash, C. W.,	Ames,	Story.
Nelson, Fred O.,	Toledo,	Tama.
Ness, Henry,	Somers,	Calhoun,
Nichols, S. S.,	Marshalltown.	Marshall.
Oppenheim, Ramsey,	New York,	*New York.*
Parks, P. C.,	Ames,	Story.
Peterson, A. L.,	Algona,	Kossuth.
Porter, Briggs,	Centerville,	Appanoose.
Powell, A. L.,	Camanche,	Clinton.
Rasmussen, Fred,	Jewell,	Hamilton.
Reinbott, Chas.,	Grinnell,	Poweshiek.
Roberts, G. A.,	Marathon,	Buena Vista.
Scott, C. R.,	Cambridge,	Story.
Smith, Stuart H.,	Monticello,	Jones.
Smith, Walton L.,	Council Bluffs,	Pottawattamie.
Stimson, Robert S.,	Marion,	Linn.
Stout, E. A.,	Stout,	Grundy.
Tener, W. A.,	Brevard,	*North Carolina.*
Thomas, Elbert,	Green Mountain	Marshall.
Trostel, George,	Des Moines,	Polk.
Watson, E. B.,	Ames,	Story.
Western, Clarence A.,	Beaconsfield	Ringgold.
Wilson, R. E.,	Berlin,	Tama.

FRESHMEN.

NAME.	TOWN.	COUNTY.
Adams, Paul,	Clinton,	Clinton.
Adams, R. K.,	Solon,	Johnson.
Alexander, C. C.,	Conrad,	Grundy.
Anderson, Arthur,	Brayton,	Audubon.
Annette, Leslie,	Spencer,	Clay.
Arthur, Ernest,	Millersburg,	Iowa.
Atkinson, W.,	Clear Lake,	Cerro Gordo.
Bauch, R M.,	Miles,	Iowa.
Bridges, Earl,	Oskaloosa,	Jefferson.
Brown, Wesley,	Indianola,	Warren.
Buckman, Harry,	West Liberty,	Muscatine.

Burnap, S. M.,	Clear Lake,	Cerro Gordo.
Campbell, J R.,	Webster City,	Hamilton.
Cave, Roy A.,	Randalia,	Fayette.
Chalupnick, J. C.,	Traer,	Tama.
Claxton, Robert,	Randalia,	Fayette.
Coates, Samuel F.,	Marshalltown,	Marshall.
Cohagan, Orville,	Blakesburg,	Wapello.
Compton, Leon R.,	Elmira,	*New York.*
Conover, J. A.,	Ames,	Story.
Corning, Stanley,	Hampton,	Franklin.
Coverdale, J. W.,	Delmar,	Clinton.
Cowgill, Ralph,	West Branch,	Cedar.
Crossley, Bruce,	Council Bluffs,	Pottawattamie,
Crouse, R. W.,	Dike,	Grundy.
Dean, Preston,	Adair,	Adair.
Decker, Earl,	Mt. Vernon,	Linn.
Draper, Franklin,	Sutherland,	O'Brien.
Eastman, W. R.,	Nashua,	Chickasaw.
Eastwood, George,	Ames,	Story.
Elliott, Jesse,	Woodward,	Dallas.
Emmons, E. P.,	Libertyville,	Jefferson.
Federlein, F.,	Atalissa,	Muscatine.
Fish, Don,	Adel,	Dallas.
Forsyth, L. R.,	Griswold,	Cass.
Foster, F. H.,	Glidden,	Carroll.
Fry, Samuel A.,	Corydon,	Wayne.
Fryberger, Boyd,	Eagle Grove,	Wright.
Fuller, Rolla S.,	Sutherland,	O'Brien.
Gaskill, Ona,	Sutherland,	O'Brien.
Gregory, C. V.,	Burchinal,	Cerro Gordo.
Griffin, Clyde,	Manson,	Calhoun.
Griffin, J. L.,	Buckingham,	
Guernsey, S. C.,	Confidence,	Wayne.
Haller, C. L,	Farley,	Dubuque.
Harriman, Chas. B.,	Hampton,	Franklin.
Hawn, John,	Newton,	Jasper.
Hicks, Fred,	Hampton,	Franklin.
Hicks, H. P.,	Manchester,	Delaware.
Higgins, Fosse,	Keswick,	Keokuk.
Hill, Alva F.,	DeWitt,	Clinton.
Hoffman, R. C.,	Ottumwa.	Wapello.
Horlacher, F S.,	Storm Lake,	Buena Vista.
Humbert, Eugene,	Corning,	Adams.
Hunt, John M.,	Ackley,	Hardin.
Huston, Clark,	Col. Junction,	Louisa.
Hutchins, Irving,	Algona,	Kossuth.
Ingels, Fred G.,	Meriden,	Cherokee.
Jenkins, Carl,	Ames,	Story
Jenkins, John,	Col. Junction,	Louisa.
Jinderlee, C. F.,	Elma,	Howard.

Johnson, A. M.,	Greene,	Butler.
Johnson, Earl,	Oskaloosa,	Mahaska.
Johnson, L. P.,	Davenport,	Scott.
Jones, John W.,	Ayrshire,	Palo Alto.
Jones, Roland E.,	Iowa City,	Johnson.
Kelsey, Bruce,	Dawson,	Dallas.
Kelsey, Lewis E.,	Iowa Falls,	Hardin.
Kemp, Warren,	Marion,	Linn.
Kendall, Chas.,	Luther,	Boone.
Kinzer, Horace G.,	Bangor,	Marshall.
Kirby, E. E.,	Ames,	Story.
Knox, R. G.,	Cherokee,	Cherokee.
Kohler, Alfred,	Haverhill,	Marshall.
Kuhn, W. H.,	Council Bluffs,	Pottawattamie,
Lambing, Herbert,	West Liberty,	Muscatine.
Lawrence, C. W.,	Braddyville,	Page.
Leininger, Frank,	Ames,	Story.
Liebberknecht, E. W.,	Letts,	Louisa.
Long, Loren,	Ames,	Story.
Lundeen, Leonard,	Paullina,	O'Brien.
Madson, B. A.,	Ames,	Story.
Mallette, F. G.,	Garden Grove,	Decatur.
McBeath, M. W.,	Whiting,	Monona.
McConnell, E. V.,	Winthrop,	Buchanan.
McKinley, James M.,	Humeston,	Wayne.
McMillan, A. R.,	Dunkerton,	Blackhawk.
McVicker, A. B.,	Eagle Grove,	Wright.
Meacham, H. A.,	Clay,	Washington.
Meiser, Frank,	Solon,	Johnson.
Meredith, J. A.,	Marne,	Cass.
Morrow, Harry,	Conrad,	Grundy.
Murphy, John,	Reinbeck,	Grundy.
Naylor, E. C.,	Stratford,	Hamilton.
Norman, Alvah,	Omaha,	*Nebraska.*
Northrop, Clarence A.,	Ida Grove,	Ida.
Okey, James,	Prescott,	Adams,
Paine, Raymond,	Eagle Grove,	Wright.
Palmer, Warren,	Wellman,	Washington.
Pechstein, Paul,	Keokuk,	Lee.
Peshak, Irving,	Plymouth,	Cerro Gordo.
Pimlott, John,	Montezuma,	Poweshiek.
Porter, Albert,	Centerville,	Appanoose.
Pullen, Gail C.,	Onawa,	Monona.
Putt, Lyle M.,	Afton,	Union.
Railsback, Clifford,	Cedar Rapids,	Linn.
Reyes, Julio,	Buenos Ayres,	*South America.*
Rieke, F. C.,	Blairstown,	Benton.
Ritland, L. J.,	Roland,	Story.
Rittgers, John H.,	Grimes,	Polk.
Roe, C. C.,	Oskaloosa,	Mahaska.
Rowe, Erwin A.,	Chapin,	Franklin.

Ruehlman, William,	Melbourne,	Marshall.
Schaeffer, L. L.,	Eagle Grove,	Wright
Secor, A. J.,	Ames,	Story.
Sheehan, Dan,	Melbourne,	Marshall.
Schulte, J. J.,	Osage,	Mitchell.
Schiele, Arthur,	Bluegrass,	Scott.
Simpson, H. H.,	Knoxville,	Marion.
Smith, E. D.,	DeWitt,	Clinton.
Solomonson, C.,	Estherville,	Emmett.
Stone, Earle,	Massena,	Cass.
Stuart, LeRoy,	West Branch,	Cedar.
Stubblefield, David,	Jefferson,	Greene.
Summers, J. F.,	Malvern,	Mills.
Sullivan, R. J.,	Des Moines,	Polk.
Templeton, E. G.,	Ames,	Story.
Terrazas, Wm., F.,	Chihuahua,	*Mexico.*
Thompson, Irwin,	Jamaica,	Guthrie.
Thompson, Theodore,	Grand Forks,	*North Dakota.*
Thompson, Will,	Ayreshire,	Palo Alto.
Troger, Leslie,	Storm Lake,	Buena Vista.
Trowbridge, Robert,	Des Moines,	Polk.
Turner, Frank, E.,	Marshalltown,	Marshall.
Wallace, J. M.,	Allerton,	Wayne.
Watts, Thomas,	Preston,	Jackson.
Weber, W. I.,	Iowa City,	Johnson.
Weeks, Henry J.,	Guthrie Center,	Guthrie.
White, J. W.,	Perry,	Dallas.
Whiting, C. N.,	Whiting,	Monona.
Willits, E. V.,	Union,	Hardin.
Wilson, A. R.,	Clinton,	Clinton.
Wilson, M. L.,	Ames,	Story.
Wilson, T. J.,	Columbia,	Marion.
Wisner, Scott,	Omega,	*Nebraska.*
Worswick, Albert,	Spencer,	Clay.
Wosoba, Henry,	Oxford Jct.,	Jones.
Wygle, Fred.,	Clarksville,	Butler.
Ziliox, C. T.,	Hamilton,	*Ohio.*

ACADEMIC.

NAME.	TOWN.	COUNTY.
Beaty, G. R.,	Guthrie Center,	Guthrie.
Bixler, Burr,	Hoyt,	Adams.
Botsford, H. E.,	Corning,	Adams.
Bowdish, C. B.,	Waubeek,	Linn.
Hill, H. T.,	Ames,	Story.
Packer, Elwood E.,	Marshalltown,	Marshall.
Simpson, H. H.,	Knoxville,	Marion.
Stephan,John,	Early,	Sac.

Wilson, C. M.,	Almont,	Clinton.
Wilson, M L.,	Ames,	Story.

DAIRY.

NAME.	TOWN.	COUNTY.
Acheson, R. C.,	Maxwell,	Story.
Back, James,	Afton,	*Wisconsin.*
Backer, Lewis,	Le Mars,	Plymouth.
Brockway, J. H.,	Michel,	*South Dakota.*
Brodsky, F. J.,	Plover,	Iowa.
Brooks, A. J.,	Lisbon,	Linn.
Carr, C.,	Fredericka,	Bremer.
Clark, W. G.,	Preston,	Jackson.
Clausen, S. J.,	Randall,	Hamilton.
Clausen, H.,	Randall,	Hamilton.
Cochrane, A.,	Stuart,	Guthrie.
Collgler, James,	Toronto,	Clinton.
Creswell, J. C.,	Wapello,	Louisa.
Crosgrove, Dick,	Sibley,	Osceola.
Davis, E. N.,	Bloomfield,	Davis.
Davis, J. H.,	Bloomfield,	Davis.
Day, T .R.,	Roseberg,	*Oregon.*
Diederick, Frank J.,	Granville,	Sioux.
Douglas, John O.,	Villisca,	Montgomery.
Druecker, August,	Conroy,	Iowa.
Dreucker, John,	Conroy,	Iowa.
Edwards, L. S.,	Moulton,	Appanoose.
Farnham, J. C.,	Rockford,	Floyd.
Fjetland, G. N.,	Ellsworth,	Hamilton.
Flagel, L. H.,	Osterdoch,	Clayton.
Flickinger, L. L.,	Elwell,	Story.
Frank, W. C.,	Terril,	Dickinson.
Frandson, A. N.,	Doon,	Lyon.
Gammil, C. E.,	Suberry,	*Ohio.*
Gearhart, S. E.,	Goose Lake,	Clinton.
Gleu, Oliver,	Cottage Hill,	Dubuque.
Goin, M.,	Beattie,	*Kansas.*
Green, John M.,	Nampa,	*Idaho.*
Hall, J. H.,	Plattsmouth,	*Nebraska.*
Hansen, Hans,	Ames,	Story.
Helsagon, W. M.,	Seneca,	Kossuth.
Henricksen, J. M.,	Elkhorn,	Shelby.
Herring, E G.,	Dexter,	Dallas.
Holecek, Anthony,	Hayfield,	Hancock.
Hoopman, Fred,	Chester,	Howard.
Hummel, Geo. F.,	Dike,	Grundy.
Jackman, J. R.,	Fontanelle,	Adair.
Jenson, Martin,	Carpenter,	Mitchell.
Johnson, Albert,	Tripoli,	Bremer.
Jones, J. E.,	Larrabee,	Cherokee.

Klopp, L. C.,	Bedford,	Taylor.
Lange, Ernest,	Preston,	Jackson.
Larson, Frank L.,	Dows,	Wright.
Lee, S. E.,	Rembrandt,	
Lewes, John E.,	Stuart,	Guthrie.
McCune, E. T.,	Rippey,	Green.
McCuen, David E.,	Savannah,	*Georgia.*
McGeehon, Ed,	Atlantic,	Cass.
McGranaham, W. H.,	Norway,	Benton.
McKibben, Walter,	Stuart,	Guthrie.
McNeil, George,	Ames,	Story.
Menzies, G. A.,	Wilton Junction	Muscatine.
Mansfield, Clark,	Topeka,	*Kansas.*
March, G. L.,	Finchford,	Blackhawk.
Mead, F. K.,	Ionia,	Chickasaw.
Meier, Wm,	Crain Creek,	Blackhawk.
Metzger, John,	West Salem,	*Illinois.*
Nelson, Chris E.,	Exira,	Audubon.
Niellson, J. C.,	Elkhorn,	Shelby.
Nordmark, A.,	Inwood,	Lyon.
Odell, F. L.,	Greenfield,	Adair.
Oleson, Christ,	Sioux City,	Woodbury.
Olson, Adolph,	Spirit Lake,	Dickinson.
Peterson, C W,	Storten,	*Minnesota.*
Reid, R A.,	Hancock,	*Wisconsin.*
Reinbe, F. S.,	Montour,	Tama.
Rivara, Pedro L.,	Buenes Ayres,	*So. America.*
Rogers, F.,	Arbor Hill,	Adair.
Rundall, W. E.,	Cedar Rapids,	Linn.
Sasseen, Howard,	Veo,	Jefferson.
Schaeffer, W. J.,	Schaller,	Sac.
Schield, John,	Little Falls,	*Wisconsin.*
Senter, J. L.,	Ottawa,	*Kansas.*
Sliter, G. E.,	Stetten,	*Wisconsin.*
Soles, B. T.,	Fern,	Grundy.
Sorenson, M L.,	Pleasant Plain,	Jefferson.
Stubbs, W. F.,	Winfield,	*Kansas.*
Taylor, Fred C.,	Riverston,	*Nebraska.*
Tiernan, Albert,	Loyal,	*Minnesota.*
Cobler, A.,	Knoxville,	*Tennessee.*
Vogel, J. E.,	Stromsberg,	*Nebraska.*
Weese, Randolph,	Prairie Rose,	Shelby.
Wendt, H. D.,	Fairmont,	*Minnesota.*
Whitney, A. M.,	Alden,	Hardin.
Widner, J H,	Corning,	Adams.
Wright, F. E.,	Chariton,	Lucas.
Zbornik, L. L.,	Fayette,	Fayette.

ENROLLMENT FOR SPECIAL COURSES IN STOCK AND GRAIN JUDGING, JANUARY, 1903.

NAME.	TOWN.	STATE.
Jackson, Roy,	Trenton,	*Missouri.*
Jackson, Tom,	Trenton,	*Missouri.*
Smith, Dwight A.,	Sentinel,	*Ohio.*
Dean, Harry G.,	Ames,	Iowa.
Green, Allen,	Castalia,	Iowa.
Campbell, J. W.,	Castalia,	Iowa.
Lillibridge, Chas. D.,	Mason City,	Iowa.
Lillibridge, R. L.,	Mason City,	Iowa.
Johnson, Waldo S.,	Storm Lake,	Iowa.
Hanson, Will,	Inwood,	Iowa.
Kaup, Harry R.,	Springfield,	*Ohio.*
Gabriel, Thos. J.,	Des Moines,	Iowa.
Rexroth, John,	Wilton Junct'n,	Iowa.
Waiters, Wm.,	Bruce,	*South Dakota.*
Chandler, Fred M.,	Kellerton,	Iowa.
Nienaber, Ed. C.,	Durant,	Iowa.
Peterson, Aaron E.,	Lanyon,	Iowa.
Paul, Chas.,	Fort Dodge,	Iowa.
Johnson, C. G.,	Eldora,	Iowa.
Lynk, Chas.,	Eldora,	Iowa.
Thomas, Edwin,	Eldora,	Iowa.
Varley, Tom J.,	Stuart,	Iowa.
Harvey, Alonzo,	Ossian,	Iowa.
Brinton, Burr,	Stuart,	Iowa.
Andrews, B. C.,	Ollie,	Iowa.
Armstrong, W. N.,	Orient,	Iowa.
Callahan, J. F.,	Sac City,	Iowa.
Lewellen, M. E.,	Prescott,	Iowa.
Martin, W. G.,	Crawfordsville,	Iowa.
Swatzendruver, C. A.,	Grand Junction,	Iowa.
Lofstedt, C. E.,	Rippey.	Iowa.
Firmin, A. F., 1613 Clinton Ave.,	Minneapolis,	*Minnesota.*
Schrader, Udo, 479 Lamel ave.	St. Paul,	*Minnesota.*
Stubben, O. M.,	Alcester,	*South Dakota.*
Asbjeld, Marenus,	Alcester,	*South Dakota.*
Lerseth, John,	Beresford,	*South Dakota.*
Weeks, Ed. C.,	Eldon,	*Missouri.*
Dry, D. W.,	Seward,	*Illinois.*
Guernsey, S. C.,	Confidence,	Iowa.
Lepley, Oscar,	Union,	Iowa.
Rowen, S. R.,	Union,	Iowa.
Smith, E. N.,	De Witt,	Iowa.
Neal, B. H.,	Mt. Vernon,	Iowa.
Neal, B. C.,	Mt. Vernon,	Iowa.
Pascal, D. L.,	De Witt,	Iowa.
Youngdale, A. F.,	Harcourt,	Iowa.

Youngdale, Geo. E.,	Harcourt,	Iowa.
Balumon, T. J.,	Marble Rock,	Iowa.
Hutcheson, L. C.,	West Branch,	Iowa.
Fogg, W. E.,	West Liberty,	Iowa.
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